

Railway Age

Vol. 80 March 13, 1926 No. 15



Boston & Albany Train No. 10 Near Russell, Mass.

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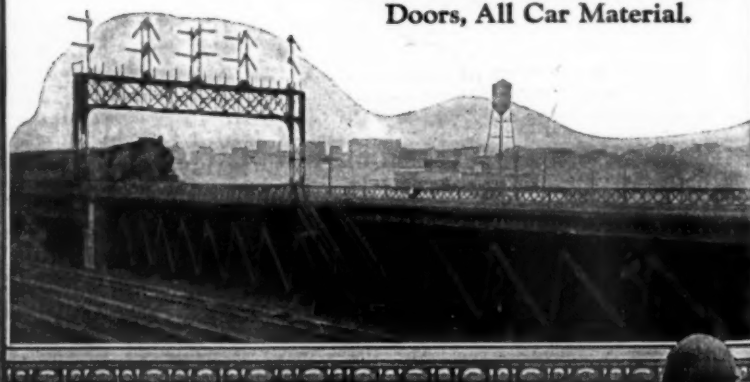
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Railway Age

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The Nickel Plate Decision

INCIDENTALLY, the Interstate Commerce Commission's decision last week in the Nickel Plate case must have been interesting reading to anyone who has paid any attention to the various forecasts published in the daily papers and elsewhere every few days during the past year, some of them before hearings were begun by the commission, as to what its decision would be. One of the favorite forms of the story was that the commission was divided five to five on the question. It was also said that Mr. Woodlock was to use his influence to try to break the deadlock, or that the change in the commission's personnel following Mr. McChord's resignation would change the decision, or that the commission would have to approve the application anyway because the President wanted it. As it turned out the application was denied by a vote of 7 to 1, three of the commissioners not taking part. In separate concurring opinions, however, Commissioners Aitchison, Campbell, Eastman and McManamy indicated that they did not agree with the finding that, from a transportation standpoint, the unification of the five particular roads involved would be in the public interest. This would seem to indicate that the eight commissioners who participated were divided four to four on that question, Commissioners Cox, Esch, Lewis and Meyer being in favor of it, while none of the commissioners was for granting the application as it stood. Commissioner Woodlock did not participate because of his former connection with the Pere Marquette negotiations; Commissioner Taylor did not become a member of the commission until after the case had been submitted on argument, and Commissioner Hall was ill.

Progress in Safety Work

AMERICAN railroads in general are achieving gratifying results in safety work in all departments and a number have turned in records recently which would have been considered impossible of attainment a few years ago. For example, an average of 650 men are employed at the Southern Pacific Shops, El Paso, Tex., and, according to a recent report of H. M. Mayo, superintendent of safety, in the 27 months ending January, 1926, a total of 2,734,701 man-hours were worked at this shop with but two "reportable" injuries, necessitating a loss of time of more than three days. The general improvement on the Texas and Louisiana Lines of the Southern Pacific is indicated by the fact that at five important shops there was a reduction of 67 per cent in reportable casualties in 1924 as compared with 1923 and a still further reduction of 39 per cent in 1925. Aside from the fact that accidents represent a serious drain on industry, both in loss of service of the injured and cost of medical attention, it is an advantage to reduce accidents to a minimum by providing safe working conditions because of the resultant improvement in morale. Thoughtful employees in all departments of railroad service, as well as those em-

ployed in other industries, are willing and able to work more efficiently when their work is organized for handling in accordance with the best practices from a safety standpoint. Owing to the rapid turnover of employees in some branches of railroad service, there is need for constant and increased effort to impress both new and old men with the importance of learning and following the practices shown by experience to be most in the interests of safety.

Maintenance of Lighting Systems

THE cost of good artificial light in railroad buildings is low in comparison with the saving it effects because of improved working conditions. Unfortunately many a good lighting system is not permitted to do its part and buildings requiring better light are denied it because lighting costs are higher than they should be. Dirty reflectors and lamps are often responsible for both of these shortcomings. Periodic cleaning is essential. Clean lighting units can be greatly assisted by light colored walls and ceilings. Depreciated lamps are seldom given attention. Although an old and blackened lamp continues to use power while it gives little light, it is seldom replaced until it burns out. Empty sockets and unobserved burn-outs also do their part in keeping the lighting system from being what it ought to be. Last but not of least importance is the common practice of using improper size lamps or lamps with the wrong voltage rating. A western road recently assigned one man to spend the better part of a year in checking these two things. The result was a saving of \$30,000 per year in lamp renewals alone, with an additional saving in electric current and an improvement in lighting conditions.

Modern Motive Power and Road Capacity

LITTLE more than a decade ago the aim in freight train loading was to secure the maximum tonnage which the locomotive was capable of handling over the ruling grades without danger of stalling. The term "drag rating" commonly applied to the maximum tonnage rating was highly suggestive of the character of the movement of these trains over the division. As track capacity became more nearly saturated and lessened credit tended to retard the enlargement of road facilities, the time element began to receive consideration as a factor in road capacity. At the outset, this consideration suggested the reduction of the train load to permit of faster movement. Reduced tonnage ratings have long been employed for time freight trains as a means of expediting deliveries where market or other commercial considerations are matters of importance, but for general application as a means of increasing road capacity, reduced tonnage ratings are not satisfactory even where the reductions from the "drag

rating" are carefully regulated so that some increase in ton-miles per train-hour is effected. There are two reasons for this: first, the increased number of train units resulting from decreased train loads cause increased interference and delays which at least partially offset the effect of greater running speed; second, the increased number of train units runs up the cost of operation. The ideal condition is one in which the speed and the ton-miles per train-hour can be increased proportionately; that is, without reducing the train load from its maximum fixed by passing track or yard track capacity. This requires not only a high starting tractive force, but high sustained horsepower capacity. All the recent developments in steam motive power are making possible this combination of characteristics in modern freight locomotives either by increasing boiler capacity or by decreasing boiler demand. Where the necessity of increasing road capacity requires either an extensive increase in roadway and track facilities or faster road movement, modern motive power of high horsepower capacity offers a most attractive investment which not only increases capacity, but decreases ton-mile operating costs for fuel and, particularly where overtime is a factor, for crew wages.

The Watson-Parker Bill and the Wage Situation

THE railways are confronted at present with an unusual situation of great importance and delicacy. This is due to two developments. One is the joining of a majority of railway executives with the leaders of the railway labor unions in support of the measure to abolish the Railroad Labor Board, which has become known as the Watson-Parker bill. The other is the starting almost simultaneously by the train service brotherhoods of a movement for a large advance in wages.

These two developments must be considered together. If the proposed legislation is passed the responsibility of railway managers in dealing with the wage movement will be made much heavier and more critical. On the way this responsibility is borne may largely depend the fate of the railways for years. If this is not generally recognized it is because not enough attention has been given to unmistakable manifestations of public sentiment.

The last ten years were a period of acute public controversies between railway executives and labor leaders. The Adamson Act was passed, the railways went through government control, the labor provisions of the Transportation Act were passed, there were repeated struggles for reductions and advances of wages, the shop employees' strike of 1922 occurred, there was a contest over the Howell-Barkley bill, and labor leaders carried on propaganda for the Plumb plan of government ownership, their political activities culminating in their support of the La Follette-Wheeler ticket in 1924.

Many things said and done since the Watson-Parker bill was introduced in Congress have shown in a striking and rather surprising way that these events, following rapidly one after another, created widespread and deep-seated hostility on the part of a large part of the public toward the railway labor leaders. Not only the National Association of Manufacturers, but also the American Farm Bureau Federation and the National Grange, have appeared in opposition to this bill. Questions asked and statements made in congressional committee hearings and public discussions have disclosed that a large part of the public and many public men regard with suspicion and apprehension the agreement of a majority of railway executives with the labor leaders upon this proposed legis-

lation. Its contemplated abolition of the Railroad Labor Board, upon which representatives of the public hold the balance of power, has caused it to be attacked as disregarding the rights of the public. It has been intimated that it is the product of a "deal" between the railway and the labor leaders in pursuance of which, if the bill is enacted, an advance in wages will be made that will be expected to be passed along to the public in advances in rates. Several amendments have been proposed having the obvious purpose of practically directing the Interstate Commerce Commission, if the bill is passed, to scrutinize with especial care any advances in wages made in future, and to ignore them if it regards them as unreasonable.

That the passage of the bill would change the situation with respect to wages in a very important respect is plain. The Railroad Labor Board exists and exercises its authority under the same law as that under which the Interstate Commerce Commission exists and exercises its authority. Therefore, the commission, in regulating rates, is virtually bound to accept as reasonable wages and working conditions fixed by the Railroad Labor Board. The Watson-Parker bill requires both railways and employees to accept an arbitration award made under it, but it is doubtful if the commission in regulating rates would be bound to accept the results of an arbitration under the bill as passed by the House. It is certain the commission would not be bound to accept as reasonable wages fixed by agreement by the railways and their employees. Probably it would be the lawful duty of the commission to form an act on its own opinion as to whether wages were fixed in accordance with the requirement of the Transportation Act that the railways shall be efficiently and economically managed. The bill has been passed by the House and probably will be passed by the Senate. Immediately thereafter the railways will be forced to decide what stand they will definitely take and finally maintain toward the proposed advance in wages. In the circumstances it probably would do the railways great harm voluntarily to grant any increase in wages.

First, this would be construed as a consummation of the "deal" at the expense of the public which it is being intimated all over the country has been made by a majority of railway executives and a group of unpopular labor leaders. A voluntary advance in wages would therefore largely destroy the favorable public sentiment toward the railways which they have been engaged for years in trying to deserve and create.

Secondly, if an advance in wages voluntarily granted by the railways were to be recognized in rate-making it would have to be justified by them and on the record of facts it would be extremely difficult to justify. A large part of the public, especially in rural districts, believes railway wages are too high now. It is idle to say that advances to only the train service employees are being demanded and that they could be granted without advances in rates. The western roads already need an advance in rates, and an advance to the train service employees would increase their need of it. Furthermore, any advance given to the train service employees would be followed immediately by demands from other classes of employees. The question actually involved is whether a general advance shall be given to all classes of employees on railways throughout the United States.

The only demands for specified advances that have yet been presented are those of the conductors, brakemen and other trainmen. The wages awarded to these employees by the Railroad Labor Board effective May 1, 1920, were held by the Board to be and were generally accepted as adequate at that time as measured by all the standards applicable in fixing wages. Wages were reduced in 1921 owing to changed conditions, and the new wages fixed

were held and generally accepted as reasonable under the changed conditions. Since then there have been general advances of wages in train service. At present the rates of pay of conductors, brakemen, etc., are from 4 to 6 per cent less than those fixed in 1920, which were the highest in history, while the cost of living is 18 per cent less than in 1920. The present rates of pay of conductors, brakemen, etc., are from 4.7 per cent to 8 per cent higher than those fixed by the Labor Board in 1921, while the cost of living is $1\frac{1}{2}$ per cent less than it was then. Therefore, measured by the cost of living all these employees are now receiving higher wages than those awarded in either 1920 or 1921. The average wage in manufacturing industries declined 18 per cent in 1921 as compared with 1920 and is still 9 per cent less than in 1920. Therefore, as compared with 1920, wages of employees in train service are now relatively higher than in manufacturing industries. The wages being asked by conductors, brakemen, etc., would be from 10 to 20 per cent higher than the peak wages fixed for them by the Labor Board in 1920, although the cost of living is 18 per cent less than it was then. They would be from 21 to 36 per cent higher than those fixed by the Labor Board in 1921, although the cost of living is slightly less than it was then. They would be from 15 per cent higher for yard conductors to 28 per cent higher for passenger brakemen than the wages being paid now. They would increase the payroll about \$150,000,000 annually, while corresponding advances in all railway wages would increase it about \$580,000,000.

Upon what grounds the demands for these very large advances are based remains yet to be stated by those who make them. They cannot be justified on the basis of the net operating income being earned by the railways, or on the cost of living, or on the general level of commodity prices, or on the wages being paid in other industries. An advance in the wages of train service employees would make almost inevitable advances in the wages of other employees, and this in turn would make necessary advances in freight and passenger rates if the railways were not to be bankrupted. While, however, an advance in rates is needed in western territory to enable the railways to earn anything approaching a fair return, the present relationships between commodity prices in general, railway rates in general and the wages of railway employees are not such as to warrant the suggestion that rates should be advanced to enable railway employees to be paid higher wages. If the railways should voluntarily make an advance in wages under present conditions it would be extremely difficult for them to answer a charge that they were being improvidently managed and therefore were not entitled to earn a "fair return."

It would seem, therefore, that regardless of whether the Watson-Parker bill is passed, and especially if it is passed, the railways and each of them will have to refuse firmly and finally agree to any advance in wages if they are to avoid arousing a public sentiment hostile both to them and to the labor unions the damaging effects of which would in the long run be felt by both, but especially by the railways. Probably the conductors' and trainmen's unions would agree to arbitration. Their leaders have in the past been, in many respects, more reasonable and fair than those of most labor organizations. At any rate, the railways must recognize the importance and force of public sentiment, and especially the peculiar public sentiment that exists at present regarding the relations between the railway executives and the labor leaders. Whatever the merits of the Watson-Parker bill, it has been badly received by a large part of the public, and an early agreement under it for any advance in wages even though small, would be still worse received by a still larger part of the public.

Improvement in Locomotive Buying

THE state of the equipment market at this moment is such as to make one feel considerably more optimistic than it has been possible to feel hitherto this year. The trouble up to within the past week or two has been the lack of locomotive orders. The orders for freight and passenger cars have been coming through in rather good shape but in the case of locomotives the opposite has been true. This is shown by the fact that the locomotive orders reported in January totaled only 60 and in February only 13, which, of course, is almost no business at all. Now, suddenly and happily there has been a marked change. Thus, in last week's issue of the *Railway Age* two substantial orders were reported, 23 Mountain type locomotives for the Florida East Coast and 23 3-cylinder 4-10-2 or Southern Pacific type locomotives for the Southern Pacific. At the time this is being written it is too early to know what the Equipment and Supplies column, further back in the paper will show, but the column will at least report a very satisfactory order placed by the Southern Railway for 113 locomotives—the largest locomotive order reported in a considerable time and it will also show the Chicago, Rock Island & Pacific order for 10 Mikado and 5 Mountain type locomotives.

Nor do these orders by any means exhaust the business in prospect. The Chicago, Indianapolis & Louisville is still in the market for 6 Mountain type locomotives and well authenticated reports have it that the New York Central is contemplating the purchase of 100 locomotives and that the Pennsylvania will inquire for prices on about 200 and will build some, besides, in its Altoona shops.

DOMESTIC ORDERS

	Locomotives	Freight cars	Passenger cars
September, 1925	86	6,113	37
October	199	5,556	134
November	101	13,598	87
December	216	13,776	547
January, 1926	60	11,531	217
February	13	11,353	152

The year 1925 was an unusually poor one for the locomotive builders. A brief analysis of their income statements and reports of orders on hand will bring out some interesting and significant facts. The American Locomotive Company and the Lima Locomotive Works reported for 1925 deficits of \$843,321 and \$844,392, respectively, after charges for depreciation. The Baldwin Locomotive Works reported a profit of \$169,564, equivalent to only 98 cents a share on its preferred stock, but it made no charges for depreciation. The reason was the paucity of business in 1925 and the low prices at which most of the business was taken. As Samuel Vauclain, president of the Baldwin Locomotive Works phrased it at the annual meeting of the company, "It was a case of losing money and disorganizing plants by refusing business at a ruinous price, or letting ruinous prices run the business. Baldwin elected to accept the business."

The total locomotive orders for domestic service in 1925 were only 1,055. This made 1925 the third successive year in which there was a decrease and the total number of orders was the smallest for any year in the present century with the exception of 1919 and 1921, which were subnormal because of the after-the-war readjustment. It is not generally known that at the end of 1925 the number of locomotives as well as the aggregate tractive force of locomotives in service on the railways of this country was less than at the end of 1924. However, it happened that of the total of 1925 locomotive orders, no less than one-half were placed in the last quarter of the year, for the most part too late to be delivered in time to be reported as sales in

the locomotive companies' 1925 income accounts. The change in conditions is significant and considerably more pleasing. Thus the American Locomotive Company started the year 1925 with orders on its books totaling \$12,533,462, and its total sales in 1925 were \$27,773,493. On the other hand, orders on hand at the beginning of this year totaled \$15,919,129. The orders reported as received by this company so far this year, inclusive of the Southern Railway's order, amount apparently to about an additional twelve million dollars so that, although it is only the second week in March, the American Locomotive Company already has on its books sufficient business to equal its entire 1925 sales. The Baldwin Locomotive Works started 1925 with only \$4,500,000 orders on hand and its total sales in 1925 were \$27,876,064. It started 1926 with \$19,500,000 on its books and has since received orders for approximately an additional four million dollars, so it lacks but a comparatively small amount also of already having as much business on its books up to the second week of March as it completed in the whole year 1925. The Lima Locomotive Works started 1926 with unfilled orders on its books more than one and one-half times the gross sales during the year 1925. These unfilled orders totaled \$6,900,232 and its 1925 sales were \$4,490,028.

The resumption of locomotive buying can thus be seen to have given an entirely new and much improved status to the equipment market. It has been a question for some time as to how long the railways could continue to refrain from buying new power. Happily this question has now been answered and the uncertainty that it created has been removed.

The table given with this article shows the orders for equipment for the past six months. It should be supplemented with the statement that there are now pending several important orders for locomotives as above mentioned as well as for some 250 or 300 passenger cars and some 9,000 freight cars. This means that the equipment market seems at present to be in a very fair condition of health and prosperity. We can at least say that the gloom that accompanied the making public of the three locomotive companies' reports has now been completely dissipated.

What About the Man?

"MOST of our working hours are spent in dealing with human nature, investigating, inspecting, influencing, correcting or disciplining men. It is our job, not simply to furnish or to apply discipline so that we can say that some action has been taken, but to correct and re-educate the men who make errors and who are out of tune with the rest of the organization. It is not the amount of discipline, but the way it is handled by the local officers that determines the reaction of the men involved, and, therefore, its permanent value. *It is our job to handle men as intelligently as an engineman handles his locomotive or as a stenographer his machine.*" Thus spoke R. E. Woodruff, superintendent of the Erie at Buffalo, at the February meeting of the Railway Club of Pittsburgh.

The successful locomotive engineer must understand thoroughly the operation of every part of his machine. He must take a keen and intelligent interest in its workings and must recognize its limitations and shortcomings in order to get the very most out of it under the peak load, or in emergencies. Incidentally, it responds in a marked degree to good care and treatment. That is why so many railroad managements still insist on the assigned engine, even though in some cases more than one crew

may be assigned to a locomotive in the case of long runs. Some managements insist that better service and more miles per month can be obtained from each locomotive if it is assigned to only one engineer and his name is printed upon it. Be that as it may, it is quite generally recognized that extreme care and skill must be used for the successful maintenance and operation of a locomotive or complicated machine.

The human being is an extremely delicate, highly complicated piece of mechanism. No two human beings are exactly alike, nor do they react in the same way to the same kind of approach or treatment. Human beings control the machinery and facilities of a railroad. The performance of a locomotive, or a lathe, or any other tool or device used in the various departments, depends, of course, on its design, construction and adaptability, but even more does it depend on intelligent handling on the part of the man or woman in charge of it. This is even true, in a degree, of the so-called automatic machinery.

We insist upon a reasonable amount of manual skill and mental training on the part of those who operate tools or machines or facilities, but how about the training of those who control and direct the comparatively highly sensitive workers? How familiar are we with those influences which affect human nature or output? To what extent have we studied human nature? Economists and industrial experts tell us that management is an art or profession. Its fundamentals are being taught in some of our schools and universities. The salesman—even though he may possess much natural ability—finds it profitable to study the principles of successful salesmanship. Is it not just as important that those in charge of men should study and take advantage of the best thought and experience in the field of management and leadership? A chief executive, noted for the enthusiasm and teamwork of the employees on his road, recently remarked that if the foremen and supervisors who come in contact with the men in the ranks would study human nature and use good judgment in dealing with it, friction and unrest would disappear and we would have no more labor troubles.

Two officers were interviewed by a member of our staff last week. One, a chief executive of a strong and prosperous property, in the course of two hours or more probably did not spend ten minutes discussing the physical property, although much progress has been made in improving it during the past year. Indeed, he spoke of physical improvements only when he was asked a direct question about them. Practically all of his comments, without any attempt to direct them on the part of the interviewer, were on ways and means of cementing his organization into an enthusiastic, contented family of teamworkers. He reviewed what had been done in this respect during the past year and discussed tentative plans for the future, clearly indicating that because a new development for inspiring co-operation proved a big success one year, was no means why it should be relied upon indefinitely. New features must be added from time to time to maintain and stimulate the interest. One big task is to inspire the officers and foremen to maintain intimate contacts with the rank-and-file and deal with the men justly, and with tact and understanding.

The other officer interviewed was the chief operating officer of an extensive property, not strong financially, which had been faced with most difficult and severe operating conditions and requirements during the past year. It had been necessary to rush the building of new lines and facilities and add new equipment. Did he say much about these things, vital and important as they are? He did not, except in an incidental way! His road had made good in a large degree under the most trying circumstances. He was enthusiastic. It was not necessary to

ask him questions to get him to talk. What, in his mind, was the vital thing—the real accomplishment? It was in granting to his officers and staff authority commensurate with their responsibilities—of putting the job squarely up to them—and of developing a spirit of co-operation and teamwork on the part of all of the employees, which made it possible to get a maximum of output from inadequate facilities and equipment. This, of course, is a tremendous task. It cannot be done in a month, or a year; it takes time and is never fully accomplished. Moreover, conditions change from time to time. New elements enter into the problem. This, however, makes the game all the more fascinating.

Is not the attitude of these two officers indicative of the change of emphasis on the part of railroad managements as between *materials* and *men* which has been quietly but steadily taking place during the past few years?

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

Annual Report, Port of New York Authority, Jan. 15, 1926. Hoboken Shore Railroad, p. 6-8. Also discusses improved freight service at New York terminals. 58 p. Pub. by J. B. Lyon Co., Albany, N. Y.

Loading the Climax Basket for Long Distance Carload Movements, by R. L. Wheeler. Fruit transportation specialist discusses improved methods of loading fruit in baskets to prevent waste and loss. Canada. Dept. of Agriculture. Pamphlet No. 62-New series. 12 p. Pub. by Fruit Branch, Canadian Dept. of Agriculture, Ottawa, Canada.

Microbe Hunters, by Paul de Kruif. Of particular interest to the medical departments of railways, since it contains the stories of the pioneers in the fight against disease from Leeuwenhoek, who was the first to see microbes, to the present time, and to anyone else who likes adventure stories of an unusual type. 363 p. Pub. by Harcourt, Brace & Co., New York. \$3.50.

Report of the North Jersey Transit Commission to the Senate and General Assembly of the State of New Jersey, 1926. The engineering features of a plan of passenger transport for the nine northern New Jersey counties and between these communities and New York City. 120 p. Pub. by North Jersey Transit Comm., Hoboken, N. J.

Periodical Articles

Atomic Hydrogen Arc Welding, by R. A. Weinman and Dr. Irving Langmuir. Description of new type of electric welding made possible by discovery of flames of atomic hydrogen. *General Electric Review*, March, 1926, p. 160-168.

The Chilean State Railways, by Raoul Simon. Mileage, traffic, relations with government, finances and technical efficiency discussed by U. S. representative. *Chile*, February, 1926, p. 71-78.

Control Equipments in Operation on Staten Island Rapid Transit Cars, by Frank Guillot. Illustrated. *General Electric Review*, March, 1926, p. 184-186.

Lighting the Yards of the New York Central Railroad at Selkirk, N. Y., by W. C. Gilman and W. J. Hedley. *General Electric Review*, March, 1926, p. 196-199.

Our Alaska Railroad, by Noel W. Smith. Construction difficulties, problems of operation and future development. Illustrations and map. *Scientific American*, March, 1926,

Letters to the Editor

[The RAILWAY AGE welcomes letters from its readers and especially those containing constructive suggestions for improvements in the railway field. Short letters—about 250 words—are particularly appreciated. The editors do not hold themselves responsible for facts or opinions expressed.]

Gross Ton-Miles Per Train Hour as an Index

CHICAGO.

TO THE EDITOR:

In the *Railway Age* of February 6 there appeared an article by Professor Cunningham in regard to gross ton-miles per train hour as a measure of efficiency in train operation.

Mr. Cunningham has presented an interesting case, but I do not think that all of the important related facts in connection with the use of this unit are considered in his article. The use of gross ton-miles per train hour as a measure will not apply in all cases and might in some instances lead to serious misunderstandings. For railroad lines or divisions carrying a heavy traffic, the maximum figure for gross ton-miles per train hour will not correspond with the lowest expense of train operation when all costs are considered. This is presuming that the operation of the line is at its point of greatest efficiency so far as train delays and lost time on road, etc. are concerned. In other words, the locomotive will deliver its maximum output per dollar expended, with the slowest possible train speed and the heaviest tonnage train on such a line, but it will not produce the most gross ton-miles per train hour possible on that line.

This has been proved over and over again and to argue otherwise is to disprove the advisability or efficiency of the use of the large locomotive. The ruling grade of U. S. Railroads is somewhere around 1 per cent and on these grades with the average locomotive, the greatest ton-miles per train hour can be secured with a speed of 17 to 18 miles per hour and at about 78 per cent of the full tonnage rating (which is secured at about 10 miles per hour).

A 78 per cent train load means a 28 per cent increase in train-miles for the division and there is no question but that wages, train supplies, locomotive repairs and supervision will vary more nearly with the train-mile than with ton-miles or train-hours. Car repairs and fuel will be the same in either case since the number of cars moved and the work done is the same. Yard expenses will also be the same with either method of operation. Enginehouse expenses—road will vary with the trains run and will be higher with the greater speed. If the locomotives required are reduced in number by the higher train speed, then the interest, depreciation and taxes chargeable for locomotive equipment will be slightly reduced, but the amount of such reduction will be very small compared with the increased mileage and cost of repairs, wages, etc.

Mr. Cunningham in advocating the gross ton-miles per train hour measure should strongly qualify the means by which increased speed is brought about. Each operating division must be considered separately and, if it is a tonnage line, fast running will not be economical although

apparently most efficient in the product of gross ton-miles per engine- or train-hour. Analysis in most cases for such lines will show the lowest cost for 12 to 13 miles per hour running speed, which means 10 to 11 miles per hour scheduled speed and this with a maximum tonnage train.

On branch line roads such as the one described, where trains must be run without a full load, undoubtedly we have in the past disregarded the possibility of increasing the speed. A train speed of 8.7 miles per hour reflects on the previous supervision and needs boosting whether it be done by studying gross ton-miles per train-hour, train speed, train load, car-miles per day or any other factor.

In the example citing a 2,000 ton train taking 10 hours for 100 miles which was speeded up to seven hours, why was not a 2,500 ton train handled in the first case since the locomotive should have been capable of it if it was capable of the increased speed? Train delays and lost time on road have always been closely watched on the majority of roads, but tonnage loading being more technical has in many cases been slighted. It is also questionable how long employees' interest will be retained in such a campaign in view of the large decrease in wages, amounting in this case to perhaps 20 per cent per train-mile.

More trains mean more crews and less money per crew invariably. It is a question whether there is an ultimate saving in such a policy.

S. R. TRUESDELL,
Chief Clerk, Operating Dept., Chicago & North Western, Chicago.

Passenger Coach Service

NEW YORK.

TO THE EDITOR:

Discussing coach service in the columns of the *Railway Age*, your correspondents have proceeded upon the theory that coaches invariably are dirty, poorly lighted, heated and ventilated and have one or another disadvantage which makes them undesirable. While believing this to be the case on through trains, the writer recently made it his business to ride in a coach for the purpose of investigation.

The result was surprising. Taking a train to a city approximately one and one-half hour's ride from New York, the coach was found to be immaculately clean, the temperature satisfactory—in distinction to parlor cars which are notably too hot or too cold in winter—and everything was satisfactory to the most fastidious of travelers. I failed to notice any particular distinction in the manner in which the conductor lifted tickets as between coach and Pullman passengers, which I believe was a point made, or inferred, by one of your correspondents. During the ride I had a seat to myself.

It then occurred to me that this was not, perhaps, a fair test. This train had been made up in New York and it therefore would naturally be in a clean condition upon leaving that point. So in returning in the afternoon I arranged my time in such a way that I caught a train en route from a distant city. This train had been on the line about four hours before I boarded it. I got into a coach, looked about on the floor for the debris of papers and banana skins which your correspondents have stated are the annoying accompaniments of coach travel and found none.

Again, the car was well heated and comfortable, although the lighting perhaps could have been improved upon by having lights along the side over where passengers read rather than in a row in the roof of the car. The

absence of a smoking compartment and of clean towels would of course be noticeable for a longer journey but for a comparatively short ride, and in winter, with less dust and dirt, these inconveniences are not of great consequence.

I then engaged the train conductor in conversation. He proved to be a man who had given some thought to passenger matters. It was his impression that a larger wash-room, with clean towels and soap perhaps for a five cent-charge, would be desirable and admitted that even a small smoking room might be helpful. In passing, it may be noted that there are many parlor cars in service in which there is almost no space to smoke so that even a small room in a coach would, to this extent, give the passenger the same advantages that a Pullman offers.

While it is somewhat beside the point, he said that in his opinion, through travel is not being reduced by motor competition, the passengers on his trains remaining fairly constant over an extended period. From this, he drew the conclusion, obviously original with him even if not particularly novel, that the buses and automobiles on longer hauls, are creating their traffic to a great extent, rather than stealing it from the railroads.

This is not an ex parte defense of the coach, however, for on trains which carry no Pullmans, one has an opportunity frequently to note the unsatisfactory conditions which exist in them, particularly in summer. The railroad, of course, cannot be censured if passengers litter the floor with remains of their lunch, with newspapers and other articles. It cannot insist that passengers keep their collars on in hot weather or that mothers stop their children from crying. It can arrange, though, for a means of affording passengers somewhat better facilities.

There are many railroad travelers who consider a Pullman in day service an extravagance. Many people demur at paying \$1.50 for a seat between Boston and New York or \$1.75 from New York to Washington. While the difference in accommodations should make so moderate a charge negligible, it must be realized that many persons feel they cannot afford to pay the price. Yet they wish to travel in a clean car in some degree of comfort.

"Why, then, is it not possible to return to first and second class coaches? This suggestion may be called un-American and undemocratic, but is it not a fact that we pay in proportion to the value of the space we occupy at a theatre, a concert, a hockey game or any other event? Why not, then, in coach travel also?"

By designing a coach which would have men's and women's washrooms, with free towels and liquid soap, with a small smoking room, and perhaps even with towels on the backs of the seats to add to its interior attractiveness and cleanliness, and with lights more suitably arranged, it would seem that many passengers would pay a small added sum for these conveniences. Perhaps a charge of 50 cents on a run where the Pullman charge is \$1.50 would be a fair charge. This type of car would catch two groups of passengers; those who would like to ride in a Pullman but who feel that they cannot do so, and those who were unsuccessful in securing Pullman accommodations and who abhor a day coach for a long ride.

Many of the correspondents of the *Railway Age* obviously are not actual railroad men at the present time. Can we not hear from those whose practical experience and technical knowledge would cast light upon a very interesting question, for making day coaches more attractive appears to be a fertile field of bringing passengers to the railroad? From correspondence with railroad passenger officers, I know they are giving careful thought to these correlated questions. Their views, based upon their knowledge and observation, would be enlightening.

FRANKLIN SNOW.

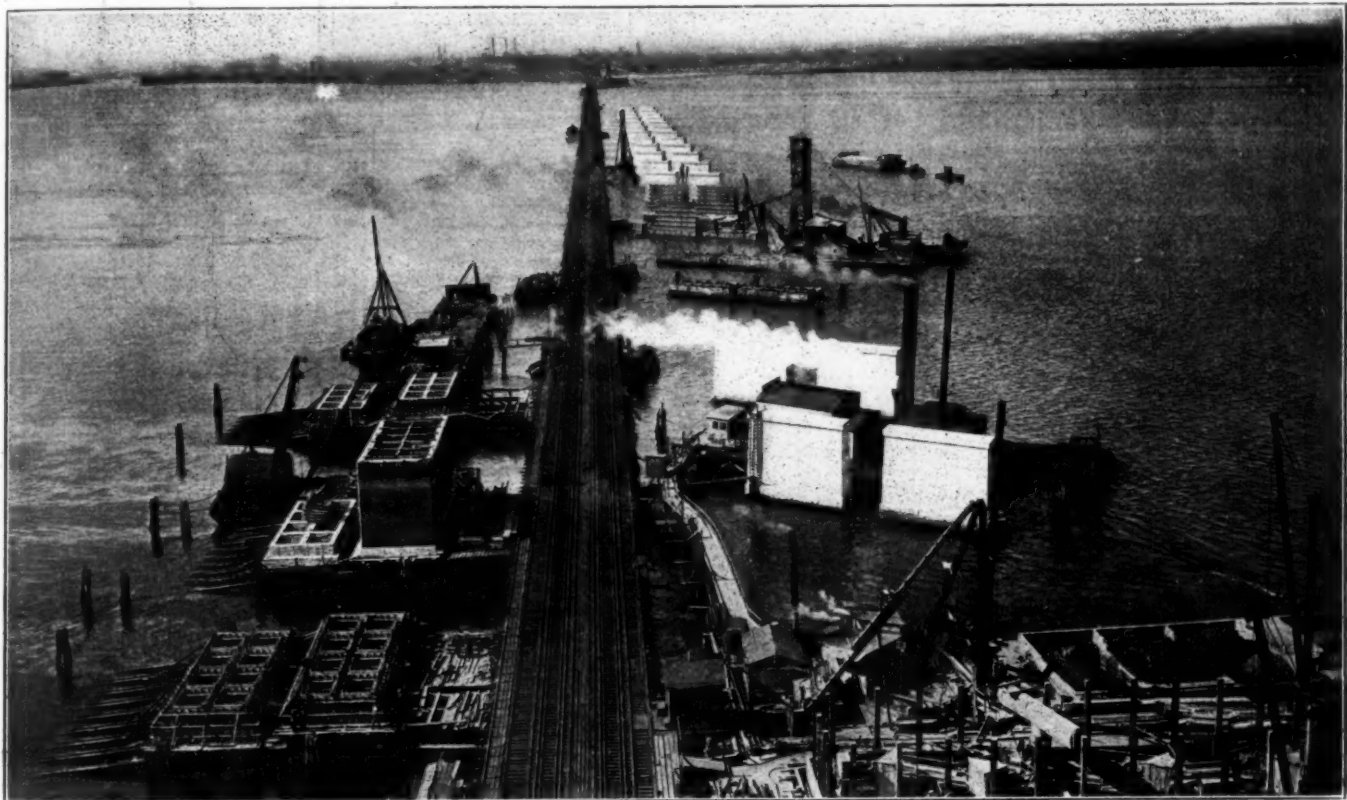
Use Novel Methods in Building Bridge Substructure

Foundation work of unusual character and scientific methods of proportioning concrete are noteworthy features of Newark Bay projects

THE substructure of the Newark Bay bridge of the Central of New Jersey, a general description of which appeared in the *Railway Age* of January 16, is no less remarkable in its character than the superstructure. This bridge is 7,411 ft. long and carries four tracks, although it consists essentially of two parallel double-track bridges, each of which embraces two through

the conditions imposed by the character of foundations were met in the design of the substructure and in the development of the most adaptable construction methods.

The bottom of the bay is clay, sand and gravel overlying rock, the surface of this material being from 3.5 to 10 ft. below mean low water, except where dredging for navigable channels has afforded water depths of 30 ft. or



A General Construction View Looking West Across the Bay. At the Left Six Caissons Are in Process of Construction on the Ways. In the Right Background Girder Span Piers in Various Stages of Construction. Right Foreground, One of the Pneumatic Caissons

truss lift spans with their flanking towers and an approach structure at each end consisting in part of typical steel viaduct construction but for the most part of long span deck girders.

To support this superstructure required the construction of two abutments, 84 double-track piers, 48 pedestals for viaduct columns and 4 piers of sufficient length to accommodate the full four-track width of the lift span structure. It involved the mixing and placing of nearly 100,000 cu. yd. of concrete, the setting of 6,200 cu. yd. of granite in protection courses at water level, the driving of 14,000 piles and a large volume of hydraulic dredging. But entirely aside from the problems imposed solely by reason of the magnitude of the project, the work affords unusual interest because of the manner in which

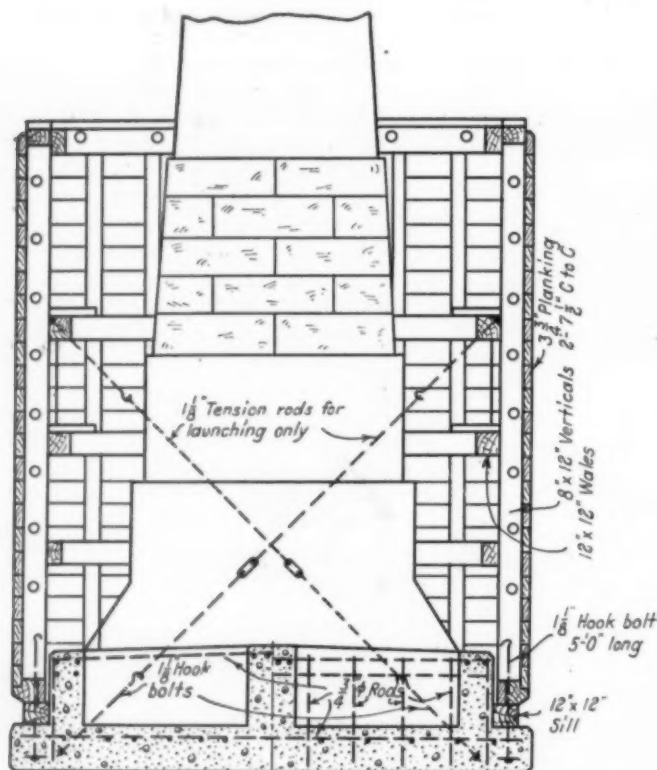
more. The rock surface lies at depths ranging from 50 to 75 ft. below mean low water.

Because the piers supporting the lift spans must be secure against any possibility of settlement and are adjacent to the dredged channels, it was decided to found them on bed rock. This necessarily implied the use of the pneumatic process in their construction. In the case of the other piers the only requirement imposed by the war department, other than those concerning their position, was that they be constructed to provide for a depth of not less than 20 ft. below mean low water. Accordingly it was decided to place these piers on pile foundations with the piles driven to rock.

The use of cofferdams for unwatering the pier foundations was considered but cofferdams with a hydrostatic

head of some 25 ft. would have been exceedingly expensive. Moreover, the nature of the materials in the bottom of the bay is such as to afford little likelihood of lowering the water level in the cofferdams to a depth that would not have required the placing of footing concrete under water, a practice that was deemed highly undesirable. Accordingly it was decided to construct floating caissons and sink these on the tops of the piles, the bottoms of these caissons to be of concrete so as to form the footing for the piers and the sides to be of timber of a removable construction for re-use in the building of as many piers as possible.

These piers are 51 ft. high from bottom of footing to the bridge seat, which is $34\frac{1}{2}$ ft. long by 7 ft. wide. The top of the shaft below the coping is $33\frac{1}{2}$ ft. by 6 ft., the horizontal dimensions being increased by battering and by several offset steps to a length of 47 ft. and a width of $22\frac{1}{2}$ ft. at the footing level. The piers are



Section of a Floating Caisson, Showing Its Relation to the Pier

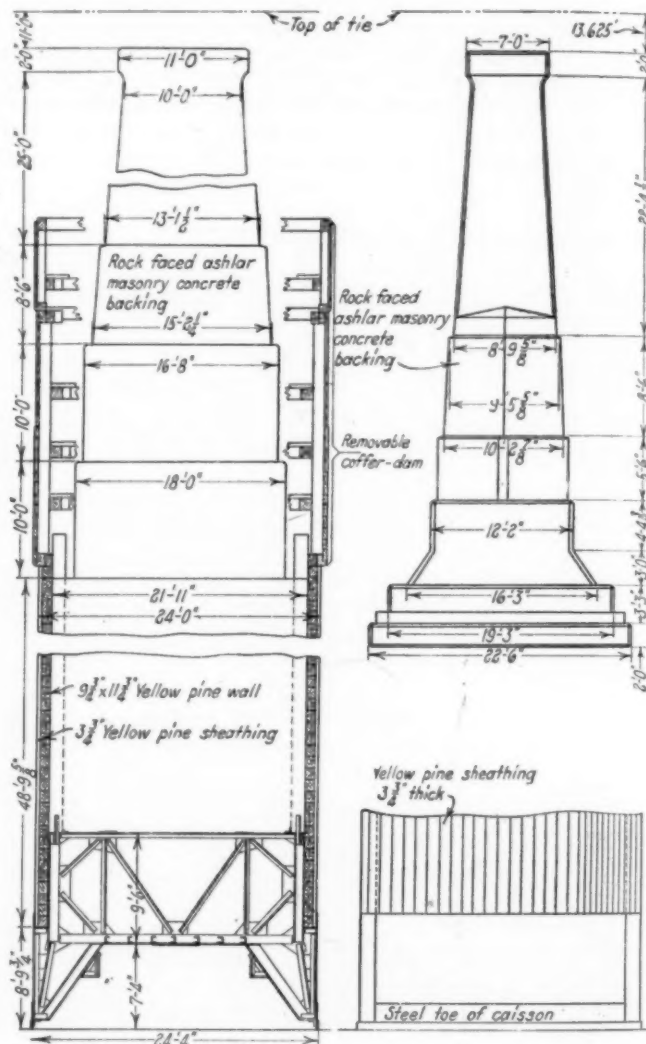
entirely of concrete except that a belt course $8\frac{1}{2}$ ft. deep extending 2 ft. above mean high water and 1.9 ft. below mean low water—is faced with ashlar granite masonry to protect the concrete in the zone of possible deterioration from sea water. All of the 84 piers on pile foundations conform to these dimensions except that 10 piers forming the rear supports of the lift span towers have been provided with overhangs at the top of the inner end so that the bridge seats of each pair of piers are practically continuous from end to end.

Each pier is supported on 305 piles, the number and arrangement being determined on the basis of a design loading per pile not in excess of 17 tons under uniform load or 30 tons as a toe pressure under eccentric loading, including the effect of traction or braking. The magnitude of this longitudinal force was the subject of a careful study which resulted in the conclusion that the conventional 20 per cent of the vertical live load, commonly provided in specifications for design, was considerably in excess of any force which it is possible to

apply through the wheels of railway equipment. In consequence the piers and their foundations were investigated for a longitudinal force of 15 per cent of the live load on one track with a reduction of 10 per cent from this value when considering the effect on both tracks.

The Sequence of Construction Operations

The construction of piers under the methods adopted necessitated the careful development of a sequence of operations, which may be outlined as follows: (1) Dredging at the site of each pier; (2) driving piles having a cut-off elevation 20 ft. below mean low water; (3)



Dimensions of the Pneumatic and Floating Caisson Piers

cutting off the piles to this level with a variation not to exceed $\frac{1}{4}$ in. in elevation; (4) building the concrete caisson bottoms on ways above water level; (5) assembling the caisson sides on these bottoms and calking the joints; (6) launching the caissons and floating them to the pier sites; (7) constructing the shafts of the piers within the caissons, the resultant increase in weight effectively settling them on the piles; (8) removing the sides of the caissons for re-use on other piers.

The dredging of the pier sites was handled in conjunction with the excavation of a channel along the north side of the new bridge for the use of marine equipment employed on the work. The total excavation amounted to 622,000 cu. yd. and was transported through floating pipes to the west shore of the bay where it was used in forming the approach embankment, being delivered to

a maximum height of 23 ft. above mean tide. This fill was finished to a height of 40 ft. by rehandling the material with a dragline machine.

Use "Under Water" Steam Hammers

To secure the maximum economy in length of piles it was necessary that they be driven so that their tops would come as near as possible to the cut-off elevation when driving was completed. But to use a follower for this purpose would have delayed the work and reduced the efficiency of the pile drivers. For this reason use was made of pile driving equipment with telescopic leads which could be extended to the cut-off elevation and with an "under water" steam hammer furnished by the McKiernan Terry Drill Company, New York. These hammers are provided with an air jacket constructed on the principle of a diving bell whereby the hammer works under water under the same conditions as in the open air. Sufficient air pressure is maintained in the chamber which encloses the hammer to keep the water from rising within it. The hammers are of the double-acting type weighing 13,000 lb. with a 3,625-lb. ram. Two complete pile driving outfits mounted on barges were used, each machine driving about 60 piles per eight-hour day. The piles were from 30 to 45 ft. in length and almost uniformly 14 in. in diameter at the butt. After the piles had been driven they were cut off with a circle saw on a vertical shaft supported and driven from a barge. No difficulty was experienced in obtaining a cut-off within the tolerance of one-quarter inch variation in elevation. Thus the group of piles for each pier formed a level platform 20 ft. below low water level on which to set the caissons.

The design of floating caissons developed for this work may be described as a watertight box of sufficient strength and buoyancy to support the pier which was built within it until the weight of the pier was sufficient to settle the bottom of the caisson on the piles. The bottom consisted of a concrete slab 24 in. thick surmounted by walls 3 ft. 9 in. high and 18 in. thick and one longitudinal and three transverse diaphragms 2 ft. thick. The

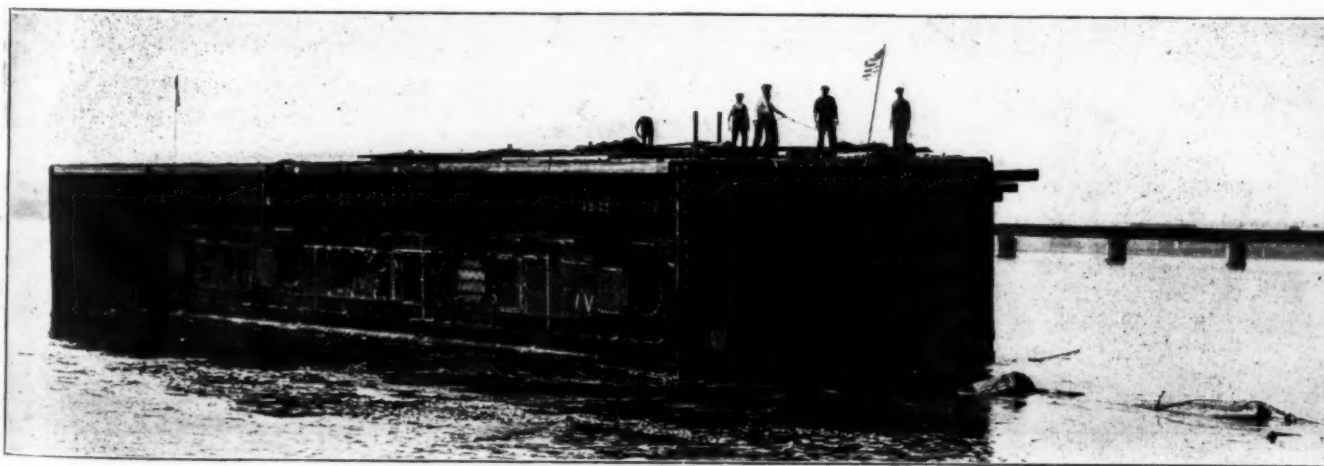
In addition four diagonal rods extending from the upper wales on one side to hook bolts projecting from the base on the opposite side served as sway bracing.

When the piers were completed and the sides of the caissons could be released the bolts in the vertical joints of the side walls were removed. Then the vertical hook rods were loosened at the top to permit disconnection



Constructing a Pier Inside a Floating Caisson

from the hooks projecting from the concrete bottom, this hook connection having been adopted to avoid the hazard of having men go to the bottom of the caissons during this operation. This having been completed the equalizing of water pressure by flooding the interior of the caissons permitted the sides to be floated free.



The Pneumatic Caissons Were Launched on Their Sides

side walls were set back 19½ in. from the edges of the slab to provide a shoulder on which to rest the sides of the caissons which were constructed of timber. These sides were built of 3¾-in. plank fastened to a framework consisting of 8-in. by 12-in. posts placed about 2 ft. 8 in. center to center and 12-in. by 12-in. wales and sills. The sides were secured to the bottom by means of 1½ in. diameter vertical rods passing down through all of the waling and having hooks at the lower end to engage hook bolts projecting from the top of the base slab.

All of the caissons were constructed on three ways, each of which, as seen in one of the photographs, was of sufficient size to permit the construction of two caissons simultaneously. The contractor was given the choice of constructing the caissons in the inclined position, as shown in another photograph, or with the sides vertical and after experience the vertical position was found somewhat more convenient. The ways were substantially constructed and cost about \$20,000 each, but as they were used in the building of 84 caissons the cost per pier

averaged only a little more than \$700. In the same way the re-use of the timber sides of the caissons in the construction of about 12 piers per set effectively distributed their cost. A set of timber sides and the necessary bracing cost approximately \$20,000 so the charge per pier was about \$1,700. The magnitude of the work afforded opportunity for systematic operation, which made for rapid progress and as many as eight piers were completed per month.

Pneumatic Process Employed in

Building Lift Span Piers

The four piers for the lift spans are 89 ft. long by 11 ft. wide over the bridge seat, the coping having an overhang of 6 in. on all sides. These dimensions are increased by batter and steps to 91 ft. 10 in. by 18 ft. at the top of the concrete in the caissons, which is 55½ ft. below bridge seat elevation. The caisson structure has a height of 50 ft. and is 96 ft. 10 in. by 24 ft. in plan, measured to the outside of the sheathing. The final elevation of the cutting edges of the caissons varies from elevation—71.3 to elevation—56.5, giving the piers a full height ranging from 37 ft. 8 in. to 102 ft. 6 in. The piers are entirely of concrete except for the belt of rock-faced granite ashlar masonry 8 ft. 6 in. wide extending from elevation minus 4.2 to elevation plus 4.3. The use of reinforcement is restricted to the upper 25 ft. of the shaft, which was ¾-in. vertical bars two feet center to center and ¾-in. horizontal bars 12 in. center to center in planes set back 3½ in. from the four faces of the piers to serve as temperature reinforcement. The frame for the working chamber of the caisson consisted of structural steel trusses in the shape of inverted U-frames spaced 8½ ft. center to center, the roof of the working chamber and the exterior walls of the caissons to a height of 8 ft. 9¾ in. above the cutting edge being entirely of steel plate construction. Above the steel plate work the shell consisted of 3¾-in. yellow pine sheathing placed vertically against a solid wall of 10-in. by 12-in. timbers laid horizontally, this wall being stiffened by an interior

Care in landing the caissons on bed rock and in preparing the rock under the cutting edges was effective in securing a bearing under 87 per cent of the perimeters of the cutting edges.

Another Application of Scientific

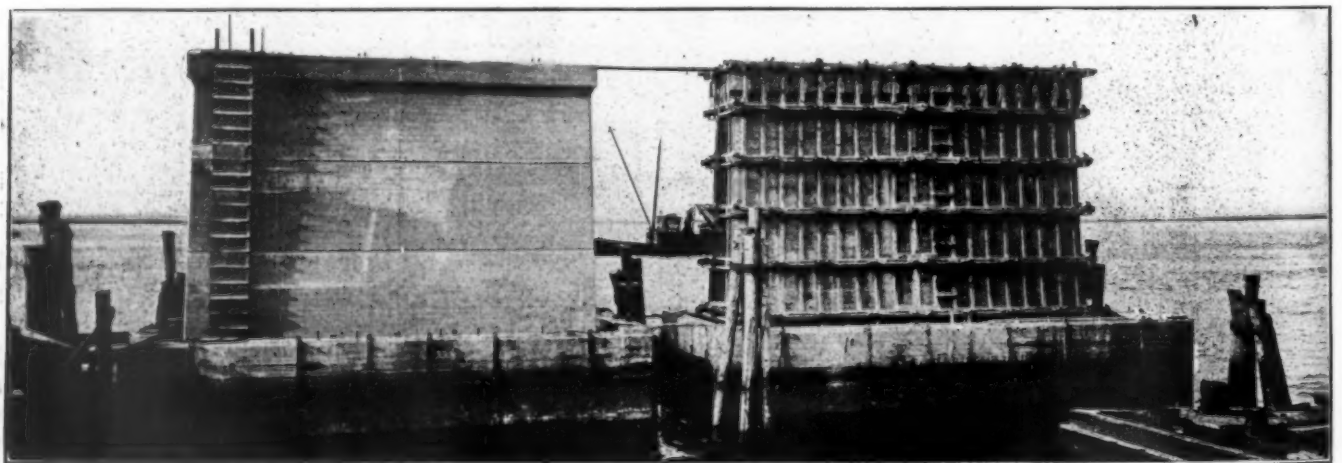
Principles in Making Concrete

The enormous investment represented by the concrete work in this bridge placed an unusually heavy responsi-



A Few of the Floating Caissons Were Constructed in an Inclined Position on the Ways, as Shown in This View

bility on those charged with its construction to insure that all of the concrete would be of a quality that would preclude any possibility of deterioration. To this end careful consideration was given to the more recent developments in proportioning and mixing concrete, particularly the work of the Structural Materials Laboratory



A Pair of the Girder Span Piers

framework of 12-in. by 14-in. timbers spaced 8½ ft. center to center.

In the construction of the pneumatic caissons the unusual procedure was adopted of erecting them on the ways on their sides instead of in the upright position. This is shown clearly in one of the photographs which was taken while launching one of the caissons, this view showing the interior of the working chamber and the lower doors of the locks. After launching, the caissons were righted and lowered to position in the usual manner.

of the Lewis Institute and the Joint Committee on Concrete and Reinforced Concrete, of which the bridge engineer of the railroad is a member. As a result the specifications for the substructure work of the bridge were so drawn as to embody the application of the water-cement ratio and the fineness modulus in the design of the concrete mixtures.

For bridge seats and the bottoms of the caissons the specified proportions were: 1 part by volume of cement to 5 parts by volume of the fine and coarse aggregates,

measured separately. For all other parts of the structure the proportions were 1 to 6, but the relative proportions of fine and coarse aggregates were determined so as to obtain a fineness modulus of 5.7, this determination being made from the results of screen analyses carried out with samples taken from each barge load of material delivered.

Each barge as delivered was loaded two-fifths with sand and three-fifths with gravel, but kept separate, both the sand and gravel (pebbles) being washed and screened before loading and loaded to give the following grading of sizes:

Fine Aggregate

- $\frac{1}{2}$ coarse grits— $\frac{1}{8}$ in. to $\frac{1}{4}$ in. in size.
- $\frac{1}{2}$ fine grits—No. 14 mesh to $\frac{1}{8}$ in. in size.
- $\frac{2}{3}$ building sand—below No. 14 mesh.

Coarse Aggregate—Pebbles

- 20 per cent to 25 per cent— $\frac{3}{8}$ in.
- 30 per cent to 25 per cent— $\frac{5}{8}$ in.
- 30 per cent to 25 per cent— $\frac{3}{4}$ in.
- 20 per cent to 25 per cent— $1\frac{1}{2}$ in.

This grading was adhered to with remarkable uniformity throughout the duration of the work.

Scrupulous care was also exercised to check the water content by means of the slump test. The amount of water was measured in a tank equipped with a glass water gage and after the work had been thoroughly organized the slump was readily kept within the range of $\frac{1}{2}$ in. to 3 in. Concrete of this consistency was readily transported in chutes having a slope of 2.8 horizontal to 1 vertical.

That this rigid field control was instrumental in obtaining a high quality of concrete was demonstrated by the high strength secured in compression tests of field specimens. Thus the strength at 28 days of the 1 to 5 concrete averaged 3,800 lb. per sq. in. and that for the 1 to 6 concrete 3,150 lb. No rubbing or other treatment of the surface was attempted after the removal of the forms as a good quality of finish was obtained without it.

Three concrete mixing plants mounted on barges were provided by the contractor. Two of the plants had one-yard Ransome mixers and the other a one-yard Smith mixer. The mixer for each plant was installed in a house near the forward end of the barge which provided storage for the cement and a bin with compartments for both fine and coarse aggregates. The charging of the mixer was handled from a floor over the mixer and under the bin for convenient access to a Blaw-Knox batcher and the measuring tank for water. The batcher was carefully calibrated so that the proportions could be modified quickly. The aggregate bin was filled from a barge by a grab bucket handled by a stiff-leg derrick and cement was delivered from barges by a belt conveyor. Concrete was discharged from the mixer into an elevating bucket, hoisted up the tower and dumped into a spout, a second derrick on the forward end of the barge being used to move the end of the spout when changing positions, etc. A boiler for supplying steam to operate the mixer, hoist, conveyor and derrick was housed at the rear of the barge. During the calendar year of 1924 the three concrete plants were used in the mixing and placing of 65,000 cu. yd. of concrete, or an average of 1,800 cu. yd. of concrete per month per mixer.

The entire project was carried on under the direction of the engineering department of the Central Railroad of New Jersey, A. E. Owen, chief engineer, J. J. Yates, bridge engineer, A. M. Zabriskie, principal assistant engineer, and H. E. VanNess, construction engineer. The piers on the pile foundation were constructed by Henry Steers, Inc., New York, and the piers on pneumatic foundations were built by the Arthur McMullen Company of New York.

Valuation Arguments

Before I. C. C.

WASHINGTON, D. C.

ORAL arguments were heard by the Interstate Commerce Commission on March 5 on a motion filed by the Delaware & Hudson and subsidiaries asking that the commission set aside its tentative valuation of their properties and make a new one in accordance with what the company declares to be the requirements of the valuation act. This was followed by arguments on the protest of the Nashville, Chattanooga & St. Louis.

H. T. Newcomb, general solicitor of the Delaware & Hudson, argued that the tentative valuation was based on insufficient facts and omits carrier property; that the commission erred in using 1914 prices; that it disregarded the law in failing to find original cost or to state the methods by which it reached the results stated, or to define and analyze "other values or elements of value," or to separate the property by states, and that it erred in the method of finding working capital.

Attorney O. E. Sweet, of the commission's Bureau of Valuation, said that by failing to produce testimony in support of its protest at the hearing set for that purpose on October 23, 1925, and in standing on its motion to quash the tentative report, the railway had in effect abandoned its protest and that the situation became the same as that in which the commission in other cases has ordered tentative valuations made final as of their dates. If the facts in the tentative valuation were insufficient, he contended, the evidence should have been presented at the hearing, and the statute clearly places upon the carrier the duty of producing evidence in support of its protest, if any, at the hearing. Attorney Hayes of the bureau also argued that the points of law raised by counsel for the carrier had been repeatedly decided by the commission in the earlier years of its valuation work and said that the United States District Court at New York had held that a tentative valuation report is but a preliminary opinion of the commission in an ex parte proceeding, in which the commission and the carriers are not adversaries but are co-operating in finding the final value. He took the position that Congress in amending the valuation act had not challenged the position taken by the commission as to other parts of the law.

In reply Mr. Newcomb said the latter argument did not apply because Congress has never re-enacted the valuation act but has merely amended it in certain particulars. When he contended that it is not impossible for the commission to find the original cost of the railroad he was asked by commissioners as to why he had not offered evidence on that point. Mr. Newcomb said he had not done so because he had understood that the Bureau of Valuation would not receive it and that it would have been very costly to prepare but that if the commission desired it, it would be produced. When commissioners asked if duplication would not result if the 35-mile branch line referred to, over which the company operates but which it does not own, were to be inventoried to the Delaware & Hudson instead of to the owning company, Mr. Newcomb said that it could be subtracted in any addition of the valuations of all the roads but that in the tentative report there is nothing to indicate that the branch line is any part of the value of the Delaware & Hudson, although it is a fundamental part of its system and if it were taken out the backbone of its traffic would be gone. He said the company had not abandoned its protest because it had not introduced evidence before presenting its motion to set the report aside.

On the protest of the Nashville, Chattanooga & St.

Louis against the commission's tentative valuation of its property of approximately \$69,000,000, which the company claims is \$40,000,000 too low, Fitzgerald Hall, general counsel, contended that the commission has not found valuation for rate-making in the way the statute directed and he asked the commission to define and differentiate between values for different purposes so that the railways may know what elements are included in one which are not in others. He also objected because the commission had failed, as he said, to furnish a proper analysis of its methods by which it arrived at the figure for final value. Commissioner Aitchison said that he had a very definite idea himself of a rule for constructing final value but that different commissioners had used their individual judgments as to the weight to be attributed to different elements of value, and he asked how any method could be stated as one representing the combined judgment of the individual commissioners. Mr. Hall said it would be very helpful to have Mr. Aitchison's idea and that he could not conceive that the commission has not some kind of a plan for reaching the figure of final value and that is what the railways feel they are entitled to.

Commissioner Aitchison pointed out that the commission had restated the company's investment account but that it objected. Mr. Hall replied that the commission had not done so accurately and that its field men had refused to check up records which would show nearly \$7,000,000 of items of expenditure for additions and betterments which at the time had been charged to operating expenses instead of to capital account because that was the practice at that time. Commissioner Lewis called attention to the decision in the New York, Philadelphia & Norfolk case in which it had been held that such items could be included if supported by proper evidence. Mr. Hall said that a witness had been placed on the stand who had seen the work done and who had testified as to the cost of each piece of property.

Mr. Hall said that the company would admit the correctness of the commission's figure for cost of reproduction new of the physical property on the basis of 1914 prices, but that it had omitted important freight and passenger terminal properties used by the road because the title to them was in separate terminal companies. When it was pointed out that the value of these properties would be reported in the valuations of the separate terminal companies, Mr. Hall said that the latter were not common carriers and that therefore their value would not enter into the valuation for rate-making purposes of the southeastern roads as a group.

P. J. Dougherty, attorney for the Bureau of Valuation, in his reply argument said that the capitalization of the railroad was only \$27,032,325, including a stock dividend, and that the company after paying interest and dividends has accumulated a surplus equal to its funded debt. Court decisions probably make it necessary to disregard its large earnings in fixing present value, he said, but the carrier has already had such a large return that it would be unjust to allow it a value which would allow it a further return from increased rates. The company claims a total value of about \$110,000,000, not including non-carrier property as of valuation date, 1915, he said, and \$127,000,000 as of 1924, and is proposing a refinancing on that basis, although its cash investment was only \$19,000,000. A rule for capitalization and value should be made so clear that increases in prices due to war conditions should not be allowed to increase capitalization, he said. Regarding the items charged to operating expenses Mr. Dougherty said that they were not examined in detail by the representatives of the bureau because there was no evidence to show that the property existed as of valuation date or that they had not represented replacements when made, also that the carrier had made

no such showing as was made by the New York, Philadelphia & Norfolk in the case cited by the commissioner. As to the Western & Atlantic, he said the commission's appraisal was 300 per cent greater than that made by the state in 1888, yet the witness for the state had objected to the commission's tentative valuation of \$16,000,000 for that property. He said the additions to the commission's tentative valuation asked by the N. C. & St. L. included \$10,000,000 for land, \$9,000,000 for intangibles, and \$16,000,000 for depreciation which had been deducted. He said the commission's valuation is sufficient evidence of the carrier's earning power.

Member of Labor Board Says It Should Clear Docket

WASHINGTON, D. C.

SENATOR SACKETT, of Kentucky, on March 6 inserted in the Congressional Record a letter from Edwin P. Morrow, of the Railroad Labor Board, expressing the opinion that the board should be continued in office to the end of the fiscal year in order to be able to clear its docket of undecided cases. The new labor bill pending in the Senate would abolish the board immediately upon approval of the bill. The letter follows:

"From the evidence submitted at the hearings on the Watson-Parker railway labor bill by the House committee on interstate and foreign commerce, and from subsequent debate on the floor of the House on the same bill, it is apparent that the status of cases now pending action by the Railroad Labor Board is not generally understood or known—e. g., I quote Congressman Newton's answer to Congressman Tinch's question, taken from page 4295 of the Congressional Record, February 26, 1926, at which time it was asked whether or not the Labor Board had application for considerable raise in wages. Mr. Newton replied:

"I understand that the applications have been very greatly exaggerated, but there are, I think, one, two, or three applications pending for wage increases.

"For your information the Railroad Labor Board now has on hand 87 applications for increases in rates of pay, the requests involving approximately \$32,295,541; there are also pending 11 applications covering dockets involving requests for changes in rules and working conditions, making a total of 98 applications for decisions covering cases that may be termed major disputes in which the public is interested.

"The attached statement of dockets now before the Labor Board, in addition to indicating the number of wage and rule disputes, also sets forth an additional 439 disputes that are pending decisions. These include wage and rule interpretations, grievances, etc. There is also attached communications from the executives of certain labor organizations in which they are urging that their pending disputes be decided by the Railroad Labor Board. During the year 1925 the Labor Board docketed 618 cases, and during January and February, 1926, it docketed 116 cases.

"In justice to the parties that have voluntarily submitted these disputes in all sincerity to the Labor Board and who have expended thousands of dollars in their preparation, and in justice to the United States government, that has also spent thousands of dollars in the hearing of evidence and reducing same in form preparatory to decision, all of which will be lost by the contemplated unnecessary and hasty action in attempting to abolish the Railroad Labor Board without providing for its consideration of the business now before it, the Labor Board should be allowed to continue its operation until the end of the fiscal year, June 30, 1926, by which time it will have been able to clear its calendar by rendering decisions on all undecided disputes.

"I trust you will give this situation the careful consideration it deserves."

President Coolidge, it was stated at the White House press conference on March 5, takes the position that the railway labor bill that passed the House last week and is now pending in the Senate should not in any way be considered as an administration measure. The President believes that credit for it should go to the railways and the labor organizations who drafted it and that the fact that they were able to agree represents a long step forward toward the solution of railway labor controversies.

Comment on Nickel Plate Decision

Lisman terms it a disappointment to the speculator and a solace to the far-sighted investor

THE decision in the Nickel Plate case is termed by F. J. Lisman of F. J. Lisman & Co., New York, "a disappointment to the speculator and a solace to the far-sighted investor." It sets up, he maintains in a statement commenting on the decision, a number of new guide posts on the road to consolidation. These are summarized in the following four requirements that the Interstate Commerce Commission, as the servant of the people, will insist be observed.

1. Any railroad consolidation must be in the interest of the public from a transportation point of view.

2. The property must not be overcapitalized and the financial plan must be sound and just to all parties concerned.

3. The control of the property must be in the hands of bona fide owners and not of any set or clique of men who by devious devices may seek to maintain themselves in control, although owning but a comparatively small percentage of the securities.

4. The weaker carriers tributary to the larger lines must also be provided for in consolidation so as to assure an adequate service to the adjacent communities.

There is much discussion here remarks regarding all these points, "mostly on the part of people who refuse to take a broad public view."

Effect on Future Consolidations

"The Nickel Plate decision," Mr. Lisman contends, "cannot be taken as being discouraging to future consolidations in any way, shape or manner, but those who are planning such action must follow the principle of fair dealing with all parties in interest and must concede to stockholders the right to change the management of their properties. It is emphatically not in the interest of the public nor of the security holders that any management should be permanently nailed to the saddle, because any set of officials who are not subject to removal for incompetency or malfeasance may possibly become negligent, or worse."

"The process of railroad consolidation which was in full swing in the 80's and until interfered with by the Sherman Act of 1891 and its subsequent interpretations, and which is permitted and encouraged under the Transportation Act of 1920 will now go on apace and probably at a more rapid rate than heretofore. The road is clearly marked."

Other parts of Mr. Lisman's statement follow:

"The commission practically unanimously found that the proposed consolidation of the Nickel Plate, Erie, Pere Marquette, Hocking Valley and Chesapeake & Ohio was not contrary to public interest, in spite of the fact that under the tentative plan of consolidation promulgated by the commission in August, 1921, these lines had been distributed among four proposed different systems. There was evidently full realization of the fact, as expressed in the minority opinion, that the Chesapeake & Ohio is a property reasonably self-sufficient. The commission arrived at its decision because it was shown that no large community touched by the lines of the proposed system would be deprived of competition."

"The showing of expected substantial savings made by the Van Sweringen interests, evidently carried much conviction and the petty opposition of the State of Virginia

and some of its communities apparently carried very little weight.

"The greater Nickel Plate System was intended to reach two ports—New York and Hampton Roads. The communities around Hampton Roads objected to the plan because they feared that some of the traffic now moving in their direction, would be diverted to the port of New York; as a matter of fact the contrary is likely to be the case. The Erie has for years endeavored to take as little of its bulky commodities as possible to New York; its traffic department, probably more than that of any other railroad, has concentrated on the development of its local and interchange business. As the decades go by, and in spite of all efforts to reduce congestion around the port of New York, it will be found necessary to use its facilities more and more for high class commodities and to encourage the shippers of bulky commodities to seek other outlets. Unquestionably the greater Nickel Plate System would divert the largest possible tonnage of coarse commodities to Hampton Roads and endeavor to bring loaded ships there in order to fill its west bound cars. The Chesapeake & Ohio, through control of the Hocking Valley, has a line with low grades into the heart of the traffic territory of the middle states.

Capitalization of System

"The commission found that the proposed capitalization was sound and well within the physical value of the property and the proportion of bonds and stock satisfactory. It also found that the method of fixing the proportion of stock to be allotted to the security holders of the Chesapeake & Ohio and Hocking Valley was not equitable. The decision goes into detail in reciting the action of the board of directors of the Chesapeake & Ohio in agreeing to the lease of the property of that railroad to the Nickel Plate Company. It is pointed out that the minority stockholders were not represented at this meeting; that the proposed lease was voted on, with two exceptions, by directors of the Chesapeake & Ohio who were also directors and heavily interested in the Nickel Plate. The two directors were officers of the company and not directly representatives of the minority. In the case of the proposed lease of the Erie and Pere Marquette to the Nickel Plate, committees of directors were appointed to work out the details of the lease, so as to do justice to all parties concerned. In the case of the Chesapeake & Ohio and the Hocking Valley the Van Sweringens apparently felt themselves on account of their large stock ownership, strong enough to use steam roller methods, which were resented by the minority stockholders and also by the commission."

"If the plan had gone through, the total amount of Nickel Plate stock would have been about \$155,000,000 preferred non-voting and \$175,000,000 common stock. Of the latter the Van Sweringens would have controlled, through a little holding company of their own called the 'Van Ess Company,' about 32 per cent. It appears that the Van Ess Company has a capital stock of about 163,500 shares, of which 130,000 shares are owned by the two Van Sweringen brothers, and the balance by two other directors of the Nickel Plate, who have given an option to the Van Sweringens to purchase their interest. All the stock of

the Van Ess Company is represented by certificates of deposit, under which the Van Sweringens have the right to vote the stock for 21 years although they may in the meanwhile die or dispose of their stock ownership.

"In several previous decisions, for example, in the case of the Denver & Rio Grande, the commission had no objection to non-voting preferred stock, but in the Nickel Plate case, it is pointed out that with the preferred non-voting, the \$175,000,000 of common stock will control one billion dollars worth of property. The commission objects to having the dominant interest in this common stock tied up for 21 years to people who may dispose of their proprietary interest in the meanwhile.

"The Transportation Act was intended to provide approximately equal transportation service to all communities in the United States commensurate with their requirements. Senator Cummins, author of the Act, has frequently stated that he did not expect that any particular economy would result from the absorption of the short lines and that this was not the primary object of the Act. Congress did not intend that strong railroad companies would pick for the purpose of consolidation just what suited their particular purpose and leave out others. The commission has given expression repeatedly to this point of view. Obligatory absorption of the short lines however, does not mean that these roads should be taken over at a fancy price or taken at all if unnecessary for public needs. The strong lines will be required to take over short lines in whole or to the extent that they are necessary to the adjacent communities and at a price commensurate with their physical value and earning capacity. A short line may have 100 miles of railroad, of which only 80 are necessary for public service and 20 miles may be abandoned. Another short line, also of a total length of 100 miles may be necessary to the public to the extent of 20 miles. In the latter case, the proposed new system will be required to take over 20 miles. Each case of a short line is a matter by itself, but no doubt certain principles will be established which will be followed hereafter.

"To sum up, the Nickel Plate decision is merely another step by the commission in its consistent attitude that the public must be served in the most economical manner possible to preserve a reasonable amount of competition; that the financial structure must be sound in every respect and that the rights of all parties should be properly protected. If the Van Sweringens had dealt with the Chesapeake & Ohio and Hocking Valley in the same manner as they dealt with the stockholders of the Erie and Pere Marquette and if they had relied for permanent control on their own success in managing and developing the property, it is practically certain they would have received the assent of the commission to their plans.

"There is only one question in the Nickel Plate consolidation which was not raised before the commission, but which may have to be thrashed out in the future if the matter should come up again; that is, the treatment of the first and second preferred stock of the Erie Railroad. These stocks are 4 per cent non-cumulative and they have received no dividends for many years although the dividends were earned. Money applicable for such dividends was spent for betterments and improvements, which inured largely to the benefit of the common stockholders. Under the proposed plan which must now be changed or abandoned they were to receive but 50 per cent in Nickel Plate cumulative preferred stock, while Erie common stock was to receive 40 per cent in new Nickel Plate common, also paying 6 per cent. Erie preferred stockholders were in effect to receive a cumulative stock, paying 3 per cent dividends, instead of 4 per cent non-cumulative, while Erie common stockholders were to receive stock paying them 2.4 dividends now, with a chance for more

in the future. Naturally the preferred stockholders feel that while 3 per cent cumulative may be better than 4 per cent non-cumulative, they have had to stand by for years while the property was being built up for the benefit of the common stockholders. Now that the common stockholder is to receive some dividends, the holder of preferred stock certainly should be entitled to 4 per cent before the common stock gets anything, which is in accordance with the terms of their contract."

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended February 27, which included the Washington's birthday holiday, amounted to 912,658 cars, an increase of 48,562 cars as compared with the corresponding week of last year and a decrease of 31,856 cars as compared with 1924. This brought the cumulative total for the year to date above that for last year. Increases as compared with last year were shown in all classes of commodities except livestock, forest products and ore and in all districts except the Northwestern. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

REVENUE FREIGHT CAR LOADING—WEEK ENDED SATURDAY, FEBRUARY 27, 1926

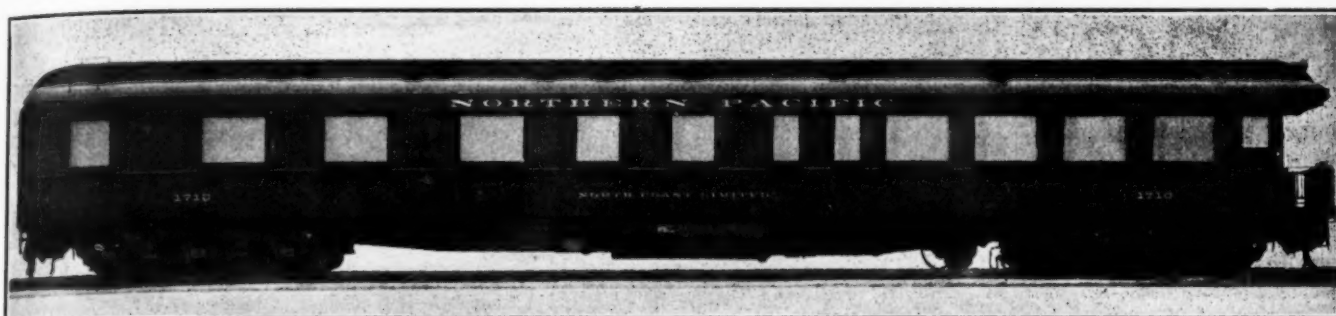
Districts	1926	1925	1924
Eastern	220,198	200,966	234,364
Allegheny	188,132	178,488	195,928
Pocahontas	51,385	40,899	45,950
Southern	153,546	145,828	142,852
Northwestern	108,406	110,271	126,298
Central Western	127,689	125,512	138,168
South Western	63,302	62,132	60,954
Total Western districts	299,397	297,915	325,420
Total all roads	912,658	864,096	944,514
Commodities			
Grain and grain products	39,816	38,321	51,166
Live stock	26,716	28,892	32,198
Coal	180,434	151,569	186,453
Coke	16,613	12,793	13,604
Forest products	73,740	79,496	81,513
Ore	11,312	11,473	9,853
Mdse. L. C. L.	237,287	230,461	245,690
Miscellaneous	326,740	311,091	324,037
February 27	912,658	864,096	944,514
February 20	931,743	925,886	845,699
February 13	917,144	903,935	935,589
February 6	914,904	929,130	906,017
January 30	925,263	897,368	929,623
Cumulative total nine weeks	8,108,459	8,079,996	7,926,089

The freight car surplus for the week ended February 28 averaged 207,683 cars, a decrease of 19,828 cars as compared with the preceding week. This included 74,151 coal cars and 87,389 box cars. The Canadian roads for the same week had a surplus of 24,725 cars, including 19,210 box cars and 200 coal cars.

Car Loading in Canada

Revenue car loadings at stations in Canada for the week ended February 27 totaled 55,564 cars, or slightly lighter than the previous week. Grain loading was 387 cars heavier, coal was 399 cars lighter, pulpwood also was lighter by 557 cars, and the total was 590 cars less. Compared with the same week last year loadings were heavier by 3,052 cars.

Commodities	Total for Canada			Cumulative totals to date	
	Feb. 27, 1926	Feb. 20, 1926	Feb. 28, 1925	1926	1925
Grain and grain products	6,908	6,521	6,727	61,183	53,527
Live stock	1,810	1,744	1,817	15,920	18,153
Coal	4,648	5,047	6,071	42,586	47,813
Coke	712	781	321	4,570	2,514
Lumber	3,356	3,533	2,815	24,192	22,795
Pulp wood	3,927	4,484	4,079	32,781	33,854
Pulp and paper	2,820	2,708	2,419	21,628	17,363
Other forest products	4,087	3,913	3,598	28,768	27,075
Ore	1,442	1,472	1,136	11,454	9,080
Merchandise, L. C. L.	14,758	14,603	14,126	114,284	109,563
Miscellaneous	11,096	11,348	9,403	84,498	78,029
Total cars loaded	55,564	56,154	52,512	441,864	419,766
Total cars received from connections	36,973	35,812	32,717	279,990	272,293



New Northern Pacific Observation-Club Car for the North Coast Limited

Unique Observation-Club Cars for the Northern Pacific

Will go on North Coast Limited on April 1—Facilities complete and furnishings attractive

THE Northern Pacific is now receiving from the Pullman Car & Manufacturing Company 10 steel observation-club cars, in the design and interior arrangement of which there are several unusual features. These cars, beginning with April 1, will be placed in service between Chicago and Seattle, Wash., on this road's North Coast Limited trains.

In order to provide room for unusually complete toilet



Complete Harmony of Decorative Details, Variety in the Selection of Furniture and the Use of Table Reading Lamps Give Character to this Observation Room

and club lounging facilities in a single car, these cars have been built with an overall length of 83 ft. and complete utilization of the possibilities of this length has been effected by building the cars without front vestibules, entrance being gained through the adjoining Pullman cars. Another unusual feature is the elimination of passenger steps and trap doors from the observation platform at the

rear of the car in order that there be no interference with the complete use of the observation platform at all times by the passengers on the train.

How the floor space of the car has been utilized is clearly indicated in the floor plan drawing, from which it will be seen that, starting at the forward end of the car, behind the Baker heater compartment, are the ladies' rooms, a single entrance from the corridor communicating with complete shower bath and toilet facilities and a lounging room, the long sofa in which may be made up into a sofa berth. Mirrors are provided in the wall over the lounge sofa and over the dressing table and a full length mirror is placed in the wall between the lounging room and the corridor.

Adjoining the women's rooms are two men's smoking rooms, each equipped with six leather upholstered chairs and a card table. An attractive feature of these rooms is found in the glass panels in the corridor partition on both sides of the doorway into each of these rooms which enable the occupants to see out of both sides of the car. Adjoining the second smoking room is the men's toilet, accessible from the corridor, and next is a well-appointed barber shop, through which access is had to the men's shower bath. Behind the large mirror in the side of the barber shop opposite the shower bath is an upper berth for the use of the attendant. The barber shop and shower are finished in white enamel and the barber shop is completely and conveniently equipped with all necessary fixtures, including a white porcelain pedestal washstand and a full size barber chair. The buffet, which occupies the last compartment adjoining the observation room, is equipped with the essential apparatus for dispensing soda water drinks and other cold beverages and is well supplied with refrigerator and locker space.

In the observation room which is slightly over 25 ft. in length, there is a marked departure from the conventional type and arrangement of furniture. It will be seen that on either side of the car has been placed a small table and reading lamp and that on one side is a capacious sofa. Across the car from the sofa is a Victor orthophonic phonograph in a cabinet which harmonized in style and finish with the other furnishings and decorations.

The comfort and general attractiveness of this

room is further enhanced by the use of chairs of three distinct types each differing from the others in appearance so markedly that the monotony of the customary rows of chairs in observation and club cars is completely eliminated. The possibility of finding a comfortable seat has also been increased by slight variations in height or tilt of those chairs which otherwise are identical in appearance.

From an inspection of the car, it at once becomes evident that its interior decoration and furnishing was not left to the engineering designer. As the keynote of the decoration of the observation room, the men's smoking rooms and the women's lounging room, the Adam motif was selected and this has been applied to produce a charming effect of harmony and good taste. The interior is finished in French walnut decorated with a color scheme in decalcomania which harmonizes with the soft colors of the carpet specially woven to conform in figure with the prevailing scheme of decoration.

The lighting fixtures were designed and manufactured especially for these cars with ornamentation and coloring in harmony with the Adam motif. The finish on the metal portions of the lighting fixtures is stained brass, accented with delicate light colors, including jade, new blue and ox-blood. In addition to ceiling lights and bracket fixtures suitably located throughout the car, the use of well-proportioned table lamps adds materially to the home-like appearance of the observation room. These table lamps weigh about 60 lb. each and are said to have demonstrated their stability even under severe switching impacts.

The windows are unusually large, both in height and width, and a person of ordinary height can readily see out of the car while standing erect. The window at the rear end of the observation room is said to be the largest ever used in car construction, measuring 4 ft. 2 in. in height by 5 in. in width. The windows throughout are of double sash construction and in winter time a third sash is applied to the outside of the car.

A floodlighting unit, containing a 250-watt projection type lamp, is mounted on the roof at the rear of the car. Its elevation and direction are controlled by a lever and hand wheel from the observation platform so that passengers can use it at night to view the passing scenery.

These cars, which are 83 ft. in overall length, measure 77 ft. 3 in. over the end sills and weigh 170,500 lb. The trucks, which are spaced 58 ft. 5½ in. between centers,

service cars. The battery, which is of the Putnam CLEF type, has a capacity of 350 ampere-hours.

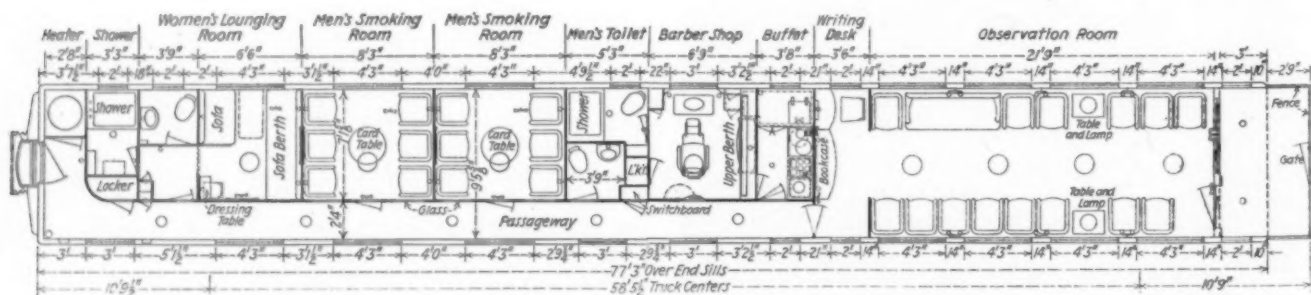
The cars are fitted with the Miner friction draft gear and buffing device, and the Pullman coupler centering and carrying device. Other special equipment of the cars includes Utility ventilators on five of the cars and Mudge



The Observation Platform Is Without Trap Doors, Stirrup Steps Being Provided for the Trainmen—The Searchlight Over the Hood is for the Pleasure of the Passengers

ventilators on the other five, with exhaust fan ventilators in the ladies' room and the two men's smoking rooms. The brakes are of the Westinghouse U.C. type with two 14-in. cylinders.

The first of these cars to be completed by the Pullman Car & Manufacturing Company left Chicago in charge of



The Floor Plan Arrangement of the Northern Pacific Observation-Club Cars

are cast steel of the six-wheel, top equalized type. They are equipped with the Miner safety locking device, Stucki side bearings and Simplex clasp brakes.

The car is equipped with axle light. The generator, regulators, batteries and lighting fixtures were manufactured by the Safety Car Heating & Lighting Company. The generator has a capacity of 4 kw. and is belt driven from a barrel type axle pulley. The regulation is of the standard Safety type such as supplied for Pullman general

representatives of the passenger traffic department of the Northern Pacific on February 20 for a tour taking in 47 eastern and middle western cities, which will be completed by the return of the car to Chicago on March 20. Among the cities included in this itinerary are Cleveland, Ohio; Detroit, Mich.; Buffalo, N. Y.; Rochester, N. Y.; Syracuse, N. Y.; New York City; Washington, D. C.; Philadelphia, Pa.; Baltimore, Md.; Harrisburg, Pa.; Pittsburgh, Pa., and Cincinnati, Ohio. At each of these

and other cities the car is open not only to railroad men, but to the general public for inspection, and careful preparations have been made to secure attention from the local newspapers. When the trip is completed, it will have given the Northern Pacific and the character of the service rendered by its North Coast Limited wide publicity in the territory from which a large volume of western travel originates.

Railroad Legislation

WASHINGTON, D. C.

THE Senate committee on interstate commerce on March 9 reported favorably the railway labor bill as passed by the House, including two amendments adopted in the House which were not in the bill at the time it was previously reported by the Senate committee as amended by the House committee. The committee also voted a favorable report on the bill introduced by Senator Mayfield of Texas, S. 3286, to authorize carriers, with the approval of the Interstate Commerce Commission, to reduce freight rates in emergencies. The committee decided to hold an executive session on Saturday, March 13, to discuss changes made by Senator Cummins in his consolidation bill.

Senator Cummins has introduced a bill, S. 3466, to provide for the payment of reparation by carriers on account of rates made in violation of the long and short haul rule and not approved by the Interstate Commerce Commission.

The bill provides:

"If any common carrier or carriers subject to the provisions of this act shall charge and collect for the transportation of passengers or of like kind of property any higher rate or charge for a shorter distance than is published for a longer distance over the same line or route in the same direction, the shorter being included within the longer, or shall charge and collect any rate or charge which yields greater compensation than the aggregate of published intermediate rates or charges subject to the provisions of this act, except when authorized by the commission or when such rates and charges are included in applications filed in pursuance to the amendment to this section of June 18, 1910, to cover rates existing at the time of the passage of the said amendment, such carrier or carriers shall make reparation to the party or parties entitled to receive the same of the amounts collected in excess of the amounts which would have been collected upon the basis of the rate or charge published for the longer haul or in excess of the aggregate of the published intermediate rates or charges as the case may be, with interest at 6 per centum from the date such amounts were charged and collected by said carrier or carriers."

The Senate is expected to take up consideration of confirmation of the appointment of Thomas F. Woodlock as a member of the Interstate Commerce Commission on March 16, according to present plans. The committee on interstate commerce has voted 8 to 7 against recommending confirmation.

Senator McKinley of Illinois made a speech against the Gooding bill in the Senate on March 4, saying the bill is opposed to the best interests of the people not only of Illinois but of all the states and that Congress should not attempt to substitute its judgment for that of the Interstate Commerce Commission. He said it is significant that in the entire 39 years of the Interstate Commerce Commission but two of its members, Commissioners Campbell and McManamy, have favored an inflexible long-and-short-haul provision in the act.

Representative Newton of Minnesota has introduced a bill in the House, H. R. 9727, to amend section 26 of the interstate commerce act, which authorizes the Interstate Commerce Commission to require automatic train control installations, by adding language making it the duty of every carrier to which a train control order has been

directed "to furnish all reasonable facilities to the engineers or other employees of the commission for inspection, at any stage, of installations of the safety devices provided for by that section, and for that purpose to furnish such employees, when properly identified, with transportation upon the locomotives or freight trains of the carrier at such reasonable compensation as may be fixed from time to time by the commission." This is in accordance with a recommendation made by the commission in its annual report.

Representative Hoch of Kansas has introduced in the House a bill, H. R. 9877, similar to the Pittman bill, S. 758, in the Senate, to amend paragraphs 3 and 4 of section 13 of the interstate commerce act to restore to state commissions some of the power over state rates which was taken from them in certain cases by the transportation act.

The House committee on interstate and foreign commerce expected to hold a meeting on Thursday or Friday to discuss with some member of the Interstate Commerce Commission recommendations for legislation made by the commission in its annual report.

The Gooding fourth section bill was made the unfinished business on the Senate calendar on March 9 but was temporarily laid aside for an appropriation bill. Whereas for a time it was expected that the bill would go through the Senate easily, representatives of shippers from the Middle West and elsewhere have been working actively among the Senators against the bill and it is now said that there are excellent prospects that it may be defeated. A recent poll of the Senators indicated a very close vote.

Railways Oppose Bill to Establish Metric System

WASHINGTON, D. C.

TESTIMONY that the adoption by law of the metric system of weights and measures would cost the railways of the United States an additional investment of \$332,835,000 and an additional annual maintenance cost of \$60,000,000 besides \$19,970,000 as interest on the additional investment, or a total of \$79,970,000 a year was offered by John R. Leighty, special engineer of the Southern, appearing for the American Railway Association, at a hearing before the House committee on coinage, weights and measures on March 4, on the Britten bill to establish the metric system by January 1, 1935, with certain exceptions.

Other testimony against the bill was given by Alfred P. Thom, Jr., general solicitor of the Association of Railway Executives, J. V. Neubert, engineer maintenance of way of the New York Central Lines; and W. P. Wiltsee, chief engineer of the Norfolk & Western.

Mr. Thom, appearing for the American Railway Association, discussed the legal aspects, saying that while the bill is so worded that it would seem that some latitude would be allowed by the provisions of the bill on authority of the Department of Commerce or a state, railroads operating in more than one state and having such diversified business contacts, would be forced to use the metric system in order to be standardized, and before 1935. He balanced the great confusion and expense that would surely result from the change against the "possible desirability" of the metric system. He added that the American Railway Express Company wished to be recorded as in opposition to the bill.

Mr. Leighty, after reading the resolution adopted by the American Railway Engineering Association at its meeting

in March, 1920, expressing opposition to the adoption of the metric system to the exclusion of the English system or the American system at present in general use, said in part:

Statement by John R. Leighty

"There has been previously filed with this committee a statement setting forth in general terms some of the effects the bill will have upon railway operation. It is the purpose now to point out more specifically the cost which some of the effects will have upon the conduct of the business of the railways.

"It is of course to be presumed that in the event that the bill becomes a law the metric system of weights and measures will be used:—

"(1) For buying or selling goods, wares, or merchandise, unless permission to use other weights and measures has been granted by the United States Department of Commerce or by an authorized State official.

"(2) For charging or collecting for the transportation of any goods, wares, or merchandise, unless permission has been granted to do otherwise by any of the authorities designated above.

"It must necessarily follow the adoption of the new units of weights and measures that the standard weights and sizes of materials used by railroads will be on the new basis without complicated fractional divisions, conforming, however, as nearly as may be with the present sizes.

"The perpetuation of railroad properties through maintenance is brought about by the replacement of single units of materials whenever necessary, instead of the abandonment of large items of property and the reconstruction of new. This point may be illustrated by the ordinary wooden trestle bridge, of which there are 143½ miles on the 12,200 miles of railroad with which I am now associated, and somewhat more than 3,000 miles on the 263,500 miles of railroad in the United States.

Bridge Timbers

"These structures are standardized on each railroad, but no considerable difference exists in the standards used by the various companies. The construction is simple in order that repairs by the replacement of single pieces of timber may be as cheap as possible.

"The usual construction is to have supporting timbers either of piles or dimension timber spaced 12, 14, or 16 feet apart, which carry on top of them caps usually 12 by 12 or 12 by 14 or 14 by 14 inches depending on the weight of cars and engines using the structure and the density of the traffic.

"The common practice is, when one of the caps on the supporting bent has decayed to the point where it needs renewal, the old one is thrown off and another is put in its place without disturbing any other part of the structure. On the top of the caps there are timbers which carry the track ties. These are usually laid three under each rail and span over two of the supporting timber bents, so that the stringers are in lengths of 24, 28 or 32 feet. The group of three stringers under each rail is packed together so that two of them end over a cap and a third one goes through unbroken. The maintenance of the stringers is done by taking out an unserviceable one and putting in a new one, so that the new one must fit into place.

"All standard sizes are based upon timbers of commercial size stringers so as not to require any work in dimensioning when repairs are made. A 7 by 14 in. stringer 12 ft. long under the metric system would be 17.28 by 35.56 c.m. by 3.6578 m. long. The new standard dimensions under the metric system would probably be 17 by 35 cm. by 3.75 m., which would have the effect of making the stringer 6⅝ by 13¾ in. by 14 ft. 3¾ in. in dimension.

"In order to put such a new standard stringer into an old standard bridge it would be necessary to put a shim or packer of ¾ in. on the side of the stringer and ¼-in. shim underneath it to raise the top to a level with the other stringers to make a bearing under the ties, in addition to which there would be a waste of 3¾ in. in the length of each stringer. The additional cost of such a replacement would be approximately \$1 per stringer over that for replacement with a timber of proper dimension.

"On the 3,000 odd miles of bridges there would be 18,000 miles of stringers, requiring complete renewal about every 10 years; or about 188 miles per year, which would be 531,500 stringers at an extra cost of approximately \$1 each. Similarly, as soon as materials are standardized to the metric system, increased costs would follow the application of all materials used in the maintenance of railroad property, or it will be necessary to purchase materials of special sizes.

"Manufacturers usually charge for 25 to 50 per cent more for special sizes than for regular standard stock sizes.

"In 1924 the railroads of the country spent somewhat in excess of two billion dollars for maintaining their property, of which approximately \$634,000,000 was for material. It may safely be

assumed that the additional cost due to the necessity of buying special sizes or using sizes that do not fit would be at least 10 per cent or somewhat more than \$60,000,000, which would continue indefinitely as an annual addition to the maintenance costs and probably would not become materially less for at least 30 years.

"The adoption of the kilometer as a standard of distance instead of the mile would require the changing of the mile markers from their present location to the new one and adding a sufficient number to take care of the increased units. There are about 262,500 mile-posts now in service, which would have to be moved and renumbered under the new system at an average cost of about \$4 each

"There would be required 157,000 additional
distance markers at \$5 each, 785,000

"Making a total of 1,835,000
for the comparatively unimportant item of changing the distance unit.

New Tariffs Would Cost \$100,000,000

"Existing tariffs would have to be re-calculated on the basis of new weights and/or distance, which cost is estimated by our vice-president in charge of traffic at \$540,000. Much of this would be common to other roads using the same tariff rates, so that this amount would not multiply by the number of roads; but it would be safe to estimate that the cost would be not less than three-fourths of the above for each of the 180 class 1 railroads in the country, which would amount to \$97,200,000. There would also be a cost for this item on the smaller roads, which would bring the total well up to \$100,000,000.

"The cost of changing standard plans, modifying specifications, etc., on the road with which I am associated is estimated by the chief engineer and mechanical engineer as being about \$75,000. This might be used as a guide for the cost on the other 180 class 1 carriers, or a total of \$13,500,000. The same work would have to be done on the smaller roads, which would bring the cost up to not less than \$15,000,000.

"In addition to the change of standard plans, specifications, etc., it would be necessary to add to and change the shop equipment, machinery, tools, etc., estimated by our mechanical engineer at a cost of not less than \$950,000 and keep a double stock of supplies for repairs to equipment due to the double standard, which would amount to about \$250,000 for a period of years during the transition from one standard of measurement to another, or a total of \$1,200,000 for one railroad, which, applied to the 180 class 1 carriers, would amount to \$216,000,000, no consideration being given to the additional buildings being required for housing the additional machinery.

Total Annual Cost of Change \$79,970,000

"The costs suggested above are probably not all that would be incurred in making the change, but are sufficient to show that it ought not be made without serious consideration. To recapitulate, we find the following as a probable minimum cost to the railroads of the country.

Additional Investment Cost:	
Changing mile posts	\$1,835,000
Changing tariffs	100,000,000
Changing standard plans	15,000,000
Change in shop machinery, tools, etc., and additional stock of supplies	216,000,000
	\$332,835,000

Additional Annual Cost:	
Maintenance of property	\$60,000,000
6% on additional investment	19,970,000
	\$79,970,000

"Nothing is included in the above for the probable increase in claims due to errors and misunderstandings of the shipper and the agents of the companies. Neither is anything included for the additional cost in the accounting department due to the necessary duplication for a period of years of accounting and statistical records used for the purpose of comparison of current operations with those of past years, which is very essential to the economic welfare of the business."

THE UNION PACIFIC has offered seven \$100 scholarships in a full term agricultural or home economics course in the Utah Agricultural College to the boy or girl between 14 and 21 years of age residing in each of Boxelder, Cache, Davis, Iron, Juab, Salt Lake and Utah counties, Utah, who can show a satisfactory record. Records must show the highest average ranking in both class instruction and supervised practical agricultural work in that county. The winner will be chosen from the 12 students ranking highest in each county.

Reduction in Interest Rate Asked

Senate committee told government should not seek a profit on its loans

RAILWAY executives and representatives of railway security owners testified before the Senate committee on interstate commerce on March 6 in support of the bill introduced by Senator Gooding, S. 2929, to authorize the Secretary of the Treasury at his discretion to refund the indebtedness of the railways to the government for not more than 40 years at an interest rate of not less than 4 per cent. The roads are now paying at the rate of 6 per cent on an indebtedness aggregating approximately \$306,000,000 and it was stated that if the Secretary of the Treasury should approve a rate of 4¼ per cent, approximating the cost of money to the government, this would result in a reduction of \$5,300,000 a year.

E. G. Buckland of the New Haven Offers

Statement of Carriers' Indebtedness

E. G. Buckland, vice-president of the New York, New Haven & Hartford, said that the indebtedness of his company to the government is \$87,130,000, including \$60,000,000 under section 207 of the transportation act, and \$27,130,000 under section 210. After explaining the origin of this indebtedness he said the company does not ask to have it forgiven; "it only asks that it may have the breathing space in which to pay every dollar of it, and in the meantime that the government shall forego a profit upon an indebtedness which is \$60,000,000 greater than it ought to be or would have been if the property had been returned to private ownership with the net earning capacity it had when taken over by the government." "The need for this breathing space and a 4¼ per cent interest rate is a real one," he said. "The company could pay off in something less than 30 years its entire debt to the government if the rate of interest were fixed at 4¼ per cent and if the company were to continue to pay 6 per cent of the principal sum and apply the balance over 4¼ per cent to discharging the principal. If the company is required to assume a heavier burden it will have just so much less with which to pay for additions and betterments essential to adequate service."

Mr. Buckland said that the interest his company is now paying the government is \$1,305,000 more than it would be at the rate of interest it is paying on its funded debt. In reply to a question as to why the bill proposed a period of 40 years when Mr. Buckland had said his company hoped to pay the debt in less than 30 years, Alfred P. Thom, general counsel of the Association of Railway Executives, said that 40 years had been set as a maximum because counsel in charge of the reorganization of the Chicago, Milwaukee & St. Paul had thought it might be necessary to ask for more than 30 years if the rate is fixed at more than 4 per cent. Mr. Buckland also inserted in the record a statement of the indebtedness of the roads to the government, under section 207 of the transportation act, representing the funding of improvements to the railroads made by the government during federal control, and under section 210, representing the balance of the loans made to the roads by the Interstate Commerce Commission from the fund provided by the transportation act, after the return of the roads to their owners by the government in 1920.

The table follows:

WASHINGTON, D. C.

STATEMENT OF INDEBTEDNESS OF RAILROADS TO GOVERNMENT AS OF DECEMBER 31, 1925

	Section 207	Section 210	Total
Alabama, Tennessee & Northern Railroad Corporation.....		\$379,000	\$379,000
Ann Arbor Railroad Company.....	\$312,000	270,000	582,000
Arkansas Harbor Terminal Railway.....		50,000	50,000
Atlanta, Birmingham & Atlantic Ry. Co.....		180,000	180,000
Baltimore & Ohio R. R. Co.....		2,900,000	2,900,000
Bangor & Aroostook Railroad Co.....		84,000	84,000
Boston & Maine Railroad.....	1,030,000	21,705,479	22,735,479
Central New England Railway Co.....		300,000	300,000
Central Vermont Railway Co.....		141,000	141,000
Charles City Western Railway Co.....		140,000	140,000
Chesapeake & Ohio Railway Co.....		8,073,024	8,073,024
Chicago & Eastern Illinois R. R. Co.....	3,425,000	785,000	4,210,000
Chicago Great Western Railroad Co.....		2,205,373	2,205,373
Chicago, Indianapolis & Louisville Railway Co.....		155,000	155,000
Chicago, Milwaukee & St. Paul Ry. Co.....	20,000,000	35,000,000	55,000,000
Chicago, Rock Island & Pacific Ry. Co.....		7,862,000	7,862,000
Chicago & Western Indiana Railroad Co.....		7,616,000	7,616,000
Cisco & Northeastern Railway Co.....		236,450	236,450
Cumberland & Manchester Railroad Co.....		375,000	375,000
Des Moines & Central Iowa Railroad.....		633,500	633,500
Erie Railroad Company.....	8,725,000	11,574,450	20,299,450
Fernwood, Columbia & Gulf Railroad Co.....		20,000	20,000
Fort Dodge, Des Moines & Southern R. R. Co.....		200,000	200,000
Gainesville & Northwestern R. R. Co.....		75,000	75,000
Georgia & Florida Railway.....		792,000	792,000
Greene County Railroad Co.....		36,000	36,000
Hocking Valley Railway Co.....		1,665,000	1,665,000
Kansas City, Mexico & Orient R. R. Co.....		2,500,000	2,500,000
Kansas, Oklahoma & Gulf Railway Co.....	1,627,800		1,627,800
Lake Erie, Franklin & Clarion R. R. Co.....		15,000	15,000
Louisville & Jeffersonville Bridge & Railroad Company.....		147,000	147,000
Maine Central Railroad Co.....		2,373,000	2,373,000
Minneapolis & St. Louis R. R. Co.....	1,382,000		2,632,000
Missouri & North Arkansas Railway Co.....		3,500,000	3,500,000
Missouri Pacific Railroad Co.....		5,389,760	5,389,760
National Railway Service Corporation.....		3,405,957	3,405,957
New York, New Haven & Hartford R. R. Co.....	60,000,000	27,130,000	87,130,000
New York, Susquehanna & Western R. R. Co.....	100,000		100,000
Norfolk Southern Railroad Co.....	200,000	1,509,600	1,709,600
Salt Lake & Utah Railroad Co.....		872,600	872,600
Seaboard Air Line Railway Co.....	2,000,000	14,453,900	16,453,900
Seaboard Bay Line Co.....		3,611,000	3,611,000
Shearwood Ry. Co.....		29,000	29,000
Tennessee Central Railway Co.....		1,500,000	1,500,000
Toledo, St. Louis & Western R. R. Co.....		508,000	508,000
Virginia Blue Ridge Railway Co.....		106,000	106,000
Virginia Southern Railroad Co.....		38,000	38,000
Waterloo, Cedar Falls & Northern Ry. Co.....		1,260,000	1,260,000
Western Maryland Railway Co.....	2,000,000	2,722,800	4,722,800
Wheeling & Lake Erie Railway Co.....	900,000	2,060,000	2,960,000
Wichita, Northwestern Ry. Co.....		381,750	381,750
Wilmington, Brunswick & Southern R. R. Co.....		90,000	90,000
Washington, Brandywine & Pt. Lockout R. R. Co.....	50,000		50,000
Waterloo, Cedar Falls & Northern Ry. Co.....	500,000		500,000
	\$102,119,800	\$178,438,643	\$280,558,443

*Note—The Boston & Maine is also indebted to the Government under Section 7, of the Federal Control Act for \$25,950,000.

Statement on Behalf of Railroad Owners' Association

A statement was read on behalf of J. D. Shatford, chairman of the Railroad Owners' Association, which, he said, represents approximately one-sixth of all Class I railroad stock issues of the country, approximately 5,500 of the stockholders of the Chicago, Milwaukee & St. Paul,

2,500 of the New York, New Haven & Hartford, and 500 of the Boston & Maine. He said in part:

"First, I desire to make it plain that we are not asking to be forgiven any part of our debt, nor to have it indefinitely postponed. We are simply placing before you what we believe to be the facts, and asking your serious consideration of what we say, in the hope that you will make it as easy for us to accomplish the payment of our obligations as it is possible, that our properties may continue properly functioning, without being hampered too much by our efforts in meeting these obligations. I have been endeavoring, since October, 1923, to obtain relief from the excessive interest charge of 6 per cent made by the government to the roads debtor to it.

"In the case of the Chicago, Milwaukee & St. Paul, which company is now in receivership, a plan is proposed by the reorganization committee, composed of Kuhn, Loeb & Co., and the National City Company, of New York, in which they purpose assessing the stockholders \$28 a share on the preferred, and \$32 a share on the common stock, of which approximately \$23 a share is intended to pay the debt due the government of 55 millions. There are 22,500 stockholders of the Chicago, Milwaukee & St. Paul, of whom I think I can truthfully say at least 50 per cent could not manage to finance the proposed assessment. They would therefore be compelled to lose their equity. In other words, they would have to sell their stock for whatever it might bring, which at this time is but a fraction of its cost to them. Should they hold their stock in the hope that they might be able to finance the assessment, but fail in doing so, according to the proposed plan, the stock so defaulted would fall into the hands of the reorganization managers free. This is true also if one payment of the assessment be made, the assessment being payable in two installments, and the second installment being defaulted on, not only the stock, but the \$15 being the first payment, would fall into the hands of the reorganization managers without charge.

"We therefore come to you and ask that you will relieve us of the burden of this assessment by granting us a period of 40 years in which to amortize the debt by a semi-annual payment, and reduction in the rate of interest from 6 per cent now being charged, to not more than 4 per cent. In view of the fact that these debts were as much a result of the war as the debts due this government by the foreign nations, we believe, as American citizens, we are entitled to as great consideration and equal treatment as to payment and interest as are the citizens and subjects of foreign countries that are debtor to the United States.

"It is my opinion that interest rates will be so low in the next five to ten years that the government will be able to borrow money at from $2\frac{1}{2}$ to $3\frac{1}{4}$ per cent, and that financing may be done by companies in good credit on a basis of 3 to 4 per cent at the most. I base my conclusions on the belief that we are increasing in wealth some ten or twelve billions annually, that our income by way of interest and principal payments on debts due us by foreign governments and peoples will amount to many hundreds of millions a year, that immigration is practically shut off, and backing up in the countries from which they formerly came, causing a great over supply of labor in these countries and reducing its cost, thus maintaining the cost of labor in this country, and to that extent preventing our growth and development, and that Europe is rapidly recovering, which recovery will cause our products, manufactured and otherwise, because of the low cost of labor which is now from one-fourth to one-half the cost of ours, and likely to grow still less, to be displaced to a considerable extent in many markets of the world, thus causing a recession in business, making

a lessened demand for money, which will influence interest rates to decline. In fact, I look for the greatest economic war in history to develop and rage within the next few years. What the result of such will be on our business can readily be visualized. Assuming such to become a fact, it will be evident that a rate of 4 per cent, running over a period of 40 years, would be profitable to the government."

Former Senator Joseph S. Frelinghuysen appeared for the Jameson defense committee, representing junior bondholders of the Chicago, Milwaukee & St. Paul, as an individual bondholder, and as representing insurance companies and other holders of St. Paul securities, as in favor of the bill as representing equitable treatment for all roads now indebted to the government. He thought it particularly fair that the government should reduce the interest rate to the cost of money to it because, he said, the greater part of the indebtedness represented expenditures made for the roads by the government, and because the government controls the earnings of the roads it should not try to make a profit from the money they owe it. He said that if this relief had been granted when it was asked of Congress last year the receivership of the St. Paul would have been avoided, "at least if the bankers had had courage," and that it would now relieve the St. Paul and the necessity of imposing a great burden in the way of an assessment on its stockholders as proposed by the Kuhn, Loeb plan of reorganization.

J. H. Hustis, president of the Boston & Maine, said that Mr. Buckland's testimony is generally applicable to that road except as to its plan for refunding its floating debt. At the time of federal control, he said, the Boston & Maine was in receivership, and while it had its own problems as to refunding, war-time control came before its plans for reorganization had matured, so that later a plan was worked out with the director general by which certain floating indebtedness assumed in connection with the reorganization was refunded by loans from the government under the federal control act. The rate of interest on the Boston & Maine debt exclusive of federal loans, averages about $4\frac{1}{2}$ per cent, he said. The government holds 6 per cent mortgage bonds of the company of a par value of \$48,685,479, on which the annual interest charge is \$2,921,128, and these represent 36 per cent of the funded debt of the company. The interest charge, however, represents 42 per cent of its total interest requirements. Because of its poor credit the last private financing by the Boston & Maine in 1922 cost $7\frac{1}{2}$ per cent. The reorganization plan undertaken early in 1925 and now in process of development contemplates the extension for 15 years from dates of maturity of \$43,500,000 of bonds due or coming due in the seven years beginning with 1925. Interest on these is to be at the uniform rate of 5 per cent. The plan provides also for the subscription by stockholders to \$13,000,000 of new capital through an issue of prior lien preference stock, the proceeds of which are to be devoted to necessary additions and improvements. This also provides for relinquishment by first preferred stockholders of a substantial part of \$12,000,000 in cumulative dividends.

"It would seem," he said, "that with these several contributions to the improvement of this property by bondholders and stockholders, in the interest of better transportation for New England, the government should not exact a profit on its loans. Instead, conditions having changed since the legislation which fixed this rate was passed, it would seem that the government might well agree to forego the profit on such loans, and to assist by extension also in the effort to enable this property to better meet the transportation needs of the large section which it serves."

The Diesel-Electric Locomotive

A discussion of the effect this type of motive power may have on future railroad activities

THE Effect of the Diesel-Electric Locomotive on Heavy Electrification" was the subject for a meeting of the New York sections of the four founder engineering societies held in New York on February 18. The speakers, however, did not adhere rigidly to the subject and the steam locomotive and all kinds of traffic conditions were considered.

A Railroad Man's Attitude

The first speaker was C. A. Stein, assistant to the general manager, Central Railroad of New Jersey. He said that he considered the principal fault of the present steam

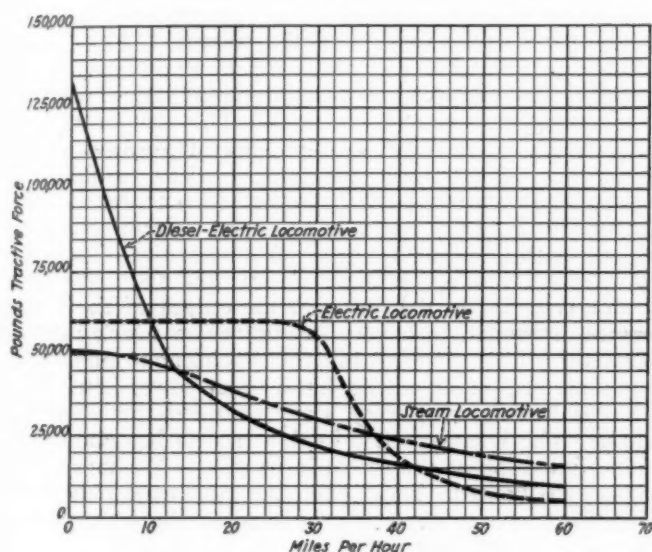


Fig. 1—Tractive Force—Speed Characteristics of Steam, Electric and Diesel-Electric Locomotives

locomotive was that it was encumbered with too many appliances, too many things to get out of order and put the locomotive in the shop. Train control, he said, aggravates this situation. Mr. Stein stated that he has hoped for years that some form of self-contained unit would be produced which would avoid the high investment cost of electrification. He believes the Diesel-electric locomotive may have a wonderful future and stated that it was his personal belief that the Central Railroad of New Jersey would never be electrified. His principal objection to electrification was that it is difficult to handle traffic with electric locomotives on one line, when there are many points of interchange with other roads.

In concluding his remarks he outlined the following advantages of the Diesel locomotive: It is a self-contained unit. No heavy investment is required to meet peak traffic demands. A change from steam to Diesel power can be made gradually. The Diesel engine introduces no danger from third rail or overhead wires. No power house or distribution system is required. The Diesel engine has a greater thermal efficiency than any other prime mover. The mechanics for maintaining a Diesel locomotive do not need to be as highly skilled as those required for an electrification system.

The second speaker was Hart Cooke, McIntosh-Sey-

mour Corporation, Auburn, N. Y. Mr. Cooke outlined a method for determining from traffic conditions what type of motive power is most desirable. In doing this he assumed that Diesel locomotives can be obtained in any capacity and that the relative values of weight, cost and availability, etc., are as shown in Table 1. Curves in Fig. 1 were included in these calculations, but as pointed out later in the discussion the curve for the Diesel-electric locomotive is that for a much heavier unit than either the steam or electric locomotive.

TABLE 1

Locomotive	Steam	Diesel-electric	Electric
Tractive Effort	See curve	See curve	See curve
Weight per hp.	100	150	75
Cost per hp.	100	300 to 400	300 to 600
Fuel Cost per hp.	100	30	37
Time in useful service	100	200	225

With the above as a premise Mr. Cooke proceeded as follows:

"We will now look into the requirements of some classes of railway service. In cities where the traffic congestion has become very great, it has been found best, where the traffic justifies the expense to put these rapid transit railways underground.

"From the fact that the traffic is heavy enough to justify the expense of putting the rails underground, only very heavy traffic need be considered.

"Also from the nature of the service a great many stops are required. This means, to maintain a schedule that the public would appreciate, the accelerations at starting must be the maximum that can be used without discomfort to the passengers. This requires tremendous power capacity for a train with the minimum weights carried by the train.

"From the fact that these railways are entirely underground and from the nature of the traffic, the trains and stations will be crowded with passengers; therefore, it is very important that no objectionable gases or excess heat be present.

"From the nature of the traffic, the maximum power requirements are only for short periods of acceleration and there will be a relatively large number of trains per mile road and a large power requirement per mile road.

"Let us now see how the various types of power work out for these conditions. To save time we will eliminate the steam locomotives as these would be too objectionable on account of the smoke and gas.

"For Diesel-electric locomotives the tractive effort curve is suitable for the high accelerations required. The weight of the locomotive, however, added to the train would increase the power necessary to give the desired accelerations. While the exhaust from the Diesel-electric locomotive would only be about one-eighth as much as from a steam locomotive, in dense subway traffic this would be objectionable. On account of the maximum power being required for only short intervals, the average power output would be low while the investment in locomotives based on the maximum power would be very high.

"For full electrification the tractive effort curve is the best that could be had for maximum accelerations. The weight, especially if the motors are put on the passenger car trucks, are minimum so as to get maximum acceleration with the minimum of power. There is no gas, and the minimum amount of heat is liberated in the subway. Because of maximum power only being required for accel-

eration, the effect of the diversification factor makes the capital cost of providing an electric power station a minimum, and the high traffic density per mile of road will reduce the relative cost of transmission lines and third rail. The fuel cost on account of the power being generated in an efficient power house will be low. Taking these things all together, and balancing the operating results against the capital investment necessary, it will be found that the relative results will be about as follows:

"If a Diesel-electric locomotive is used the weight of the train would be increased say 30 per cent, which would require approximately 30 per cent more power to give a certain desired acceleration, and the relative cost of the locomotive would be $1.30 \times 300 = 390$.

"If motors are used on the trucks, the weight of the train will only be increased, say, 10 per cent and the relative cost of this electric arrangement would be $1.10 \times 300 = 330$. The diversification factor might reduce the size and cost of the power house say one-third, which would reduce the total capital cost for electrification by, say, one-half of this amount or one-sixth, this would work out five-sixths of $330 = 275$, which indicates that the capital cost would be less for electrification with this dense traffic.

"For fuel costs, this would be $1.3 \times 30 = 39$ for the Diesel and $1.1 \times 37 = 40.7$ for electrification. The difference of these figures is only 1.7, which would be too small an item to justify the increased capital cost for the Diesel-electric shown. Therefore, full electrification gives the very best possible arrangement in every way for this particular service."

Mr. Cooke then proceeded by the same method to consider heavy suburban service, heavy main line traffic, light main line traffic, long branch line service, short branch line service and switching. From the figures obtained in each case he drew the following conclusion:

"To sum up, for very light traffic, the freight and through passenger traffic can best be handled by the steam locomotive, and the local passenger traffic by rail cars to keep the capital expenditure to a minimum, the traffic not being enough so the savings in the operation of Diesel-electric or full electrification would justify the increased capital cost.

"As traffic increases, changed conditions should be carefully analyzed to see where the steam locomotive should be supplemented by Diesel-electric, the Diesel-electric making the best showing where it can operate the most miles per day. This is along the same lines as grade reduction, curve elimination and permanent bridges for the road itself.

"The capital cost for full electrification is variable and becomes less as the traffic density increases. It is a rugged arrangement and can give lots of service at a low fuel cost and for heavy traffic, as can be seen by the figures given, the capital costs are reduced to an amount which the fuel saving justifies.

"Diesel-electric has this difference from full electrification, that the investment can be made gradually and the benefits obtained at once.

"All of the above shows that the three kinds of motive power are supplementary: For light traffic,—steam. For heavier traffic,—Diesel-electric, and for very dense traffic,—full electrification."

Diesel Locomotive Limitations and Possibilities

Norman W. Storer, general engineer, Westinghouse Electric & Manufacturing Company, the third speaker, presented a paper describing the characteristics of Diesel-electric locomotives, laying particular stress on the electrical equipment and outlining its possibilities and limitations on the basis of these characteristics. An abstract of the paper follows:

The Transmission System

The great problem after the engine itself, is the transmission of the energy developed by the engine to the driving wheels. Various methods have been tried; the direct mechanical connection is more or less satisfactory for very small outputs; the hydraulic with a little larger capacity; and a combination of these two is being exploited in Europe, but the fact that practically everyone in this country who is working on a locomotive to be operated with Diesel engine is using the electric system of transmission, indicates that there are serious limitations to the mechanical and hydraulic systems and that the great superiority of the electric is generally accepted.

Similarity of Diesel Electric to Motor

Generator Type Electric Locomotives

The Diesel-electric locomotive is similar in its characteristics, performance and equipment to the motor-generator type of a. c. locomotive which has been recently developed. The motor-generator type locomotive takes power from a single phase trolley and utilizes a synchronous motor to drive a direct current generator which generates the current for the driving motors. The Diesel-electric substitutes the engine with its auxiliaries for the synchronous motor, transformer and all other parts of the equipment pertaining to them. The equipment from and including the direct current generator to the motors is or may be practically the same. Speed regulation is by voltage control of the generator in both cases. The motors for both are low voltage, direct current series machines, with all of their rugged characteristics. The main difference between the Diesel-electric and the motor-generator type lies in the fact that the output of the Diesel engine is limited to a very definite value which may be carried for long periods while the synchronous motor with the same continuous rating, has a great power louse back of it and many carry very heavy overloads for short periods. The Diesel-electric in this respect has almost the same limitation as the steam locomotive. Its horsepower capacity is limited. It can exert the same maximum tractive effort as the all-electric because of the motor drive, but only at very low speeds.

Desirable Features of the Electrical Equipment

On a Diesel-electric locomotive, the generator and motors must be considered as a unit in calculating the output of the locomotive. The most important features of the electrical equipment are:

1. The ability to utilize the full capacity of the engine at whatever train speed it is needed or desired.
2. A high efficiency so as to transmit the maximum amount of energy from the engine to the wheels.
3. Simplicity of control.
4. Light weight.

What are the characteristics of the electrical equipment that will best utilize the engine capacity? Voltage control of the generator has already been mentioned as giving the maximum flexibility for control of speed and tractive effort. This, however, is operative only up to the normal voltage of the generator and over most of the range while overloading the motors and generator. Over-voltages are sometimes secured by forcing the generator field. Where the voltage is limited as is necessarily the case with a generator designed for a definite voltage, further speed control may be secured by weakening the fields of the motors and there is no reason why a very considerable range of speed cannot be covered in this way.

It may be said that there will be serious difficulties from commutation of the motor at weak fields and high speeds. This might be serious with motors taking current from

a trolley with all its fluctuations and surges in voltage but it is much less serious where the power plant goes with the motors. Special care must of course be taken to secure the best adjustment of the commutating field for high speeds. This is purely a matter of good design. It must be remembered that neither generator nor motor is overloaded while operating with weak fields on the motors.

Series parallel control is advantageous in some classes of service. A locomotive which is ordinarily used for road service will operate more efficiently at low speeds if the motors are connected two in series. It is the practice with some gas-electric and Diesel-electric cars, and locomotives also, to start the train with motors in series and change to parallel after gaining some speed. This, however, either requires a complete cutting off of power during the transition or a more complicated control sys-

tem. While the series parallel connection is useful, it is desirable to avoid it if possible. The advantage of series operation lies in the greater efficiency at heavy loads on account of the decreased generator current.

Efficiency

It can readily be seen that the efficiency of the electrical equipment is of the utmost importance, not simply on account of the fuel consumption but because the higher the efficiency the greater will be the energy of the locomotive available at the wheels. Every effort should be made to make it as high as possible. The electrical equipment, when properly designed, will have an excellent all-day efficiency.

Simplicity

With all of the complications of the Diesel engine and its auxiliaries to contend with, it is all the more necessary to have a simple electrical control system and it is fortunate that there are a number of ways to secure this feature. The one most commonly used provides an automatic control of the generator voltage which limits the output of the generator to the capacity of the engine so that the engine is in no danger of being stalled. This is usually combined with engine speed control. It is very desirable with the Diesel engine to keep the speed as low as possible for the output that is required, as low speed means lower maintenance, and especially lower consumption of lubricating oil, which is usually one of the most expensive items of operation. It is fortunate that this

Auxiliaries

The auxiliaries on a Diesel-electric locomotive are like the auxiliaries on other kinds of locomotives—very important and very annoying. The Diesel engine requires pumps for water circulation and for lubrication. It requires air filters and radiators with a thorough ventilating system for cooling the engine. There must of course, be ample capacity of air compressors for the brakes and control and these are preferably driven electrically, either from the main generator or from an auxiliary supply system. Means must be provided for starting the engine and this is a matter of the greatest importance since if the engine cannot be started, it is useless. It is usually started by compressed air, a pressure of from 200 to 500 pounds being necessary. In some cases the engine is started by current from a storage battery using the generator as a motor. Of course, a comparatively small amount of control equipment for the electrical apparatus will be necessary but the sum total of the auxiliary equipment amounts to quite a large proportion. Last but not least, is a good supply of fuel, oil and water.

Weight

Diesel locomotives that have been built thus far range in weight per hp. from 207 lb., which was practically the first locomotive built, to 400 lb. The largest locomotive built in this country to date is the 1,000 hp. Diesel-electric built by the Baldwin Locomotive Works, with electrical equipment manufactured by the Westinghouse Electric & Manufacturing Company. This weighs 275 lb. per hp. It is probable that it will be some time before locomotives weighing less than 200 lb. per hp. can be built regularly with Diesel-electric equipments. The engine itself varies tremendously in weight, depending very largely on the builders and the type of engine adopted. Engines weighing 50 to 75 lb. per hp. are more or less common. There are now builders in the field who manufacture Diesel engines for locomotive use, weighing 16 lb. per hp. for a 340 hp. engine. Such an engine has been built by the Beardmore Company in Great Britain and two of them are operating on articulated cars in Canada on the Canadian National Railways.

The fact that the engine itself weighs only 16 lb. or less does not of course cover the entire situation. Sixteen pounds out of 200 is not a very large proportion. When the auxiliaries required by the engine and the mechanical parts of the locomotive necessary to house and carry an engine of large capacity are included, together with fuel and water and the electrical equipment, it means a sum total that is far beyond what would ordinarily be thought necessary. As a matter of fact, the weights are pyramided. The Diesel engine pyramids weight very rapidly, due to its large dimensions which require space in the cab, and a firm foundation for the alignment of the engine and generator.

Therefore, when I give 200 lb. per hp. as the low limit for the Diesel-electric locomotive, I give a figure which has never yet been attained and which will require all of the ingenuity and refinements available to secure it. For the present, it is much safer to figure on a weight of 250 to 300 pounds.

The Field of the Diesel-electric

Now, what is the field of the Diesel-electric locomotive? Is it going to displace all of the steam locomotives and eliminate the electric from further consideration? It is quite unnecessary for anyone in the steam or electric locomotive business to be alarmed at this time. Samuel M.

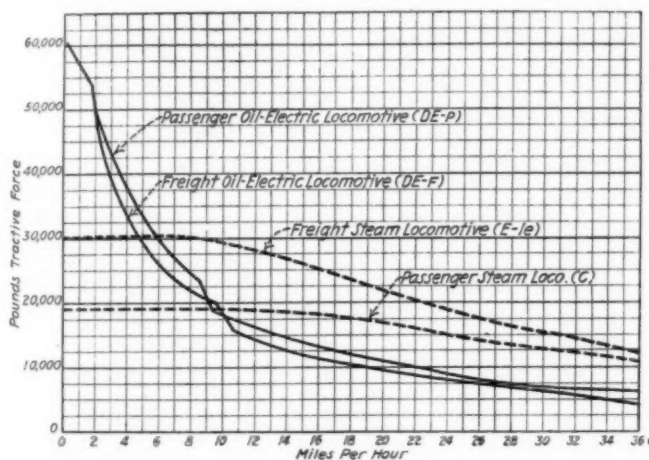


Fig. 2—Tractive Force—Speed Characteristics of Two Diesel Electric Locomotives Being Built for the New York Central and Similar Curves for the Steam Locomotives Which Will Be Replaced by the Diesel-Electrics

Vauclain has said that much time will elapse and many millions of dollars be expended to develop the Diesel-electric locomotive to a point where it will figure to any great extent in transportation service. Mr. Vauclain is probably right so far as trunk line service is concerned, but the Diesel-electric locomotive undoubtedly will have a definite field in transportation circles. The first and probably the most important field will be on branch lines of railroads in service such as the Canadian National Railways are handling with their Diesel-electric cars. Switching is another field which is a most desirable place for Diesel-electric. The ordinary steam switchers used around buildings are a great nuisance on account of the noise, smoke, and dirt which they disseminate. They are also expensive to maintain. The Diesel-electric eliminates a great part of the nuisance, is able to stay on the job for many hours at a time and probably will require little maintenance when it is taken to the round house. These features, together with the flexibility of the electric transmission and the fuel economy make a most desirable successor to the steam locomotive. It is preferable in some situations in large cities to the electric switcher, since it eliminates the necessity for the overhead wires or third rail which are extremely difficult to apply in and around buildings and represent a high investment from which little return is possible.

The Diesel-electric will probably find a certain field in main line service, especially for slow speed freight haulage, where the weight per hp. is no particular disadvantage. It will be particularly useful in this respect on branch lines where the traffic is comparatively light. Further than this, no one can speak with any degree of certainty at this time. There may be local conditions where the fuel economy of the Diesel-electric alone will make it economical for operation on long runs, even with high speeds, but in general it is not probable that it will be used to any extent for other than slow speed traffic for some years to come.

There is one point concerning it which cannot be too often emphasized;—its use does not eliminate the fundamental limitation of the steam locomotive, namely, that its power is limited to the amount that can be generated on the locomotive itself, while the electric always has all the power it can utilize.

Electrification

Electrification will go forward in terminals and on the railways having heavy traffic where the investment in overhead lines and substations does not represent a considerable part of the cost of electrification. The Diesel-electric and the straight electric locomotive will move side by side in improving the transportation of the railways of the world. The steam locomotive will still roll along for many years as it has advantages which are hard to overcome. It must be understood, however, that the steam locomotive is not the simple machine it once was. The improvements which have so greatly increased its capacity and efficiency have made it a very complicated machine and one which is most difficult to maintain. These are the reasons which will ultimately compel the retirement of a large part of them in favor either of the all-electric, the Diesel-electric or some other independent type of locomotive.

Discussion

The discussion was opened by E. B. Katte, chief engineer, electric traction, New York Central. Mr. Katte said, "The most promising field for the Diesel locomotive is in switching service in non-electrified yards, or between yards operated under different systems of electrification. Also on railroads with relatively infrequent service, or on

branch lines where the traffic is not heavy enough to provide an operating saving sufficiently large to cover the increased fixed charges on the cost of electrification. To successfully compete in either of these fields the Diesel locomotive must operate practically noiselessly and smokelessly; the economy in operation must at least equal that of the electric locomotive and the first cost must be less than the combined cost of the electric locomotive and the working conductors."

He said further that tests of Diesel-electric locomotives made on the New York Central show that a locomotive larger than 300 hp. is needed. We would like, he said, to have a 1,000 hp. locomotive weighing 100 tons. In concluding his discussion he described two Diesel-electric locomotives now being built for the New York Central and showed speed-tractive power curves for these and the steam locomotives they will replace. One will be a 750 hp. freight locomotive with a maximum speed of 40 m.p.h. weighing 256,000 lb. The other will be an 800 hp. passenger locomotive with a maximum speed of 60 m.p.h. weighing 296,000 lb. The type E-le steam freight locomotive weighs 157,100 lb. and the type C steam passenger locomotive weighs 160,000 lb. The tender in each case weighs 108,000 lb. loaded.

W. B. Potter, chief engineer, railway department, General Electric Company, spoke of Diesel-electric locomotives as a unit form of electrification and said he believed the Diesel electric would favorably effect ultimate electrification.

Sidney Withington, electrical engineer, New York, New Haven and Hartford, pointed out the fact that the Diesel-electric locomotive is very young while the steam locomotive is 100 years old and the electric 30 years old. He stated that his experience showed that the reliability of electric motive power is greater than steam in spite of the fact that it must rely upon the integrity of the power plant. The shopmen's strike in 1922, he said, also demonstrated that electric locomotives could be maintained by unskilled men. The same, he said, is probably also true of Diesel-electric locomotives. He spoke also of the need for a standard system for electrification and in response to a statement by a previous speaker said that the danger of an electrified system can be overcome by education.

To show how unlikely it is that the Diesel-electric locomotive will replace the electric for heavy service he cited the case of the Virginian on which road two locomotives apply 20,000 hp. to a train on starting. The total cost of Diesel-electric locomotives for large power requirements, he said, would be twice that for straight electric. He stated also that oil costs may change the status of the Diesel locomotive. He considers the Diesel-electric locomotive particularly suitable for wrecking train service as it is ready to go at any time without getting up steam and can travel under a dead wire.

W. S. Murray, consulting engineer, concluded the discussion by saying that the mechanical effort to move a train by any means is the same and there is no need to fear that electrification will be supplanted by the Diesel-electric locomotive.

"GENERALLY THIS FORM OF TRANSPORTATION (motor bus and truck transportation) is popular and I do not anticipate any legislation drastic enough to seriously curtail its activities, but I do believe that gradually we will have laws which will have the effect of holding it within proper limitations. My observation is that where the haul is not over 50 miles and there is density enough, these operations are reasonably profitable, but when they attempt to operate for longer distances it results in loss and ultimate discontinuance. In this I refer to regular scheduled operations." —From a statement by the president of a western railroad.

Western Roads Ask Early Rate Advance

Brief filed in Ex Parte 87 and rate investigation cases shows need of more revenue

WASHINGTON, D. C.

THE western railroads have filed their brief with the Interstate Commerce Commission on their application for increased rates in Ex Parte 87 and the commission's general rate structure investigation, No. 17,000, asking for such findings and orders as will permit them to make effective increased freight rates at the earliest practicable date. The roads had asked for an increase in revenues to produce the "fair return" defined by law and had suggested, as a remedy for the failure of the present rate structure to produce adequate revenue, an advance in freight rates of 5 per cent (with modifications for the purpose of preserving rate relationships and stated exceptions with respect to certain transcontinental rates) in the nature of an emergency measure. It was estimated that this would produce approximately \$80,000,000 in added revenue, taking 1924 as a basis and assuming an advance both in interstate and intrastate rates. As to the remaining deficiencies in revenue they suggested an upward revision of class rates in Western Trunk Line territory, estimated to increase their revenues by \$11,528,924 annually, increased express and mail rates and future consideration of particular rate relationships, but as they say these latter measures are wholly inadequate in themselves and relief thereunder is more or less remote, they have restricted their evidence to a justification of the emergency program, seeking the increase of approximately \$80,000,000. The points which the carriers believe to have been abundantly demonstrated on the record are summarized as follows:

1.—That adequate transportation in the western district cannot long be maintained without an increase in revenues;

2.—That the practical and logical method to accomplish this is by an increase in freight rates;

3.—That agricultural products and livestock form a substantial portion of the revenue freight in the whole district (producing practically 30 per cent of the freight revenue), and that carriers most largely dependent upon this character of traffic are in relatively the greatest need of increased revenue;

4.—That in respect to advances and reductions, the important farm commodities have already received preferential treatment, and

5.—That the farm groups have completely failed to show how other shippers can successfully assume the share which the agriculturists and the ranchmen would ordinarily have to contribute to the maintenance of an adequate transportation system.

"In addition," it is stated "this record also shows that the rates on agricultural products and livestock are not now contributing their fair share to adequate transportation. As to many of these commodities the rates are so low that it is doubtful whether they could successfully escape the charge of confiscation.

Livestock Rates Below Cost of Service

"In respect to livestock, we are contending in *American National Livestock Association v. A. T. & S. F. Ry. Co., et al.*, Docket 15686, that 'the lowest possible lawful rates' on livestock are at least 20 per cent higher than the present rates. On that detailed record which we are advised is to be argued concurrently with the present case, we have undertaken to show that livestock rates in the

Western district have been held at so low a level for so long a time that in the face of advanced costs and the failure of the traffic to permit of heavier loading or other economies, the rates now fail to pay the cost of the service. The proposed report of the examiner so finds.

"The farm groups, on this record, have directed their attention almost entirely to a description of their so-called economic needs. Their aspiration for an export corporation, or for other means of disposing of their annual surplus of particular crops through governmental action, are detailed in the evidence. They have, however, offered no substantial testimony to demonstrate what the 'lowest possible lawful rates' are when measured by the necessity of maintaining 'adequate transportation service' or otherwise.

"The farm groups and stock raisers have made no serious attempt to controvert the facts on the record. They seem to have relied on some hidden virtue in the Hoch-Smith resolution. But the claim that agriculturists have passed through a period of depression, that increased freight rates will be an added cost, or that farm taxes are high, does not prove that either the agriculturist would be better off with less adequate transportation service in order to avoid an increase in rates, or that the necessary increased revenue can be secured from shippers other than the farmer.

"We submit that the record here shows convincingly that the present rates on agricultural products and livestock should be increased along with other rates, or else the maintenance of adequate transportation will be jeopardized. If this record indicates any difference as between commodities, it is that the rates on farm products and livestock might well bear an even greater advance than other commodities.

"We submit that the record in this case clearly shows the need on the part of the carriers in the western district for an increase in the general freight rate level. Since the termination of federal control these carriers have bent every energy to furnishing adequate and efficient service to the shippers of the West. They have overcome car shortages and have handled the traffic more expeditiously, resulting in large economic benefits to industry and increased profits to shippers. Much that has been accomplished by the carriers in this regard has been through the medium of increases to their property by way of additions and betterments and the purchase of new equipment. Their financial program in this regard has been rendered difficult by the inadequacy of their revenues, but nevertheless has been carried on in the face of this difficulty.

Capital Only by Bond Issues

"Additional capital has been enlisted only through the medium of additional mortgages on the property, that is, by the sale of bonds. It has been impossible under the present general rate levels and resultant earning power of western railroads, for them to attract new partners to their enterprise through the sale of additional stock. That this is a matter of public interest has already been recognized by the commission in its report *In the Matter of Rates and Charges on Grain and Grain Products*, 91 I. C. C. 105.

"Meanwhile, the earning power of these properties has not been restored to its pre-war basis, nor have these

carriers been able, under the present general rate levels, to earn the fair return contemplated by the interstate commerce act. By bearing the burden of drastic freight rate reductions, particularly upon the products of agriculture, the carriers in the western district have not been restored to the same earning power as have carriers in the two other rate groups of the United States.

"The present record demonstrates that it is now necessary, in conformity with the provisions of the interstate commerce act and the so-called Hoch-Smith resolution, if the maintenance of adequate transportation service is to be continued, that the general freight rate level should be increased in the western district. We have demonstrated that the products of agriculture and livestock, in conformity with the joint resolution and with the provisions of the interstate commerce act, should reasonably and properly contribute to the need of the carriers for increased freight revenue, along with other commodities. We have shown that during the period of depression, products of agriculture and of livestock were given preferred treatment in the matter of freight rates, and that even under the proposed advances they will still be in a relatively favored situation in respect to other commodities, compared with the period before the war.

"In addition to this, we have offered evidence showing the propriety of the present relative freight rate adjustment as between commodities, and as between different sections in the western district; we have shown the free movement of commodities under this relative rate adjustment and that under the proposed increased rates these commodities will still move freely; we have presented evidence as to the general and comparative levels in the market value, and have offered testimony bearing upon the natural and proper development of the country as a whole, in so far as it is affected by freight rates and the necessity for the maintenance of an adequate system of transportation. The record consists of 12,815 pages and 495 exhibits, some of these consisting of 100 pages or more.

"Out of all this evidence, one central fact stands forth clearly—that the carriers in the western district are in need of increased revenue. The logical and practical method of obtaining additional revenue is through the medium of an advance in the general freight rate level. While there has been some criticism of this method, no one has suggested a practical substitute."

Additional excerpts from the brief follow:

Excerpts from the Brief

Ever since the passage of the transportation act the carriers in the western district have failed under existing rate structures to earn the fair return contemplated by law. Meanwhile they have been called upon to absorb large rate reductions in respect to agricultural products which constitute one of their principal sources of revenue, producing almost one-third of the total freight revenue in the western district. During this period the returns of carriers in the eastern and southern districts have steadily increased, but returns to carriers in the western district have failed to show corresponding improvement. The western carriers have no means of securing recoupment for past losses, nor do they seek to do so. They have, however, submitted their application for affirmative relief in order that in the future they may be enabled to maintain an adequate system of transportation under conditions which will be fair to their shippers, passengers, employees, investors and owners, and in the interest of the public at large.

Results of Operation—1925

During the course of the hearings, attention was directed to improvement in the earnings of railroad companies during 1925. Considerable publicity has been given to this matter, but the returns from operation show that most of the greater relative improvement took place in the eastern and southern districts, and not in the western district. Thus for the first eleven months of 1925, contrasted with the first eleven months of 1924, the following table shows the increase in net railway operating income of

Class I railroads, including large switching and terminal companies:

NET RAILWAY OPERATING INCOME		
First 11 Months 1924 and 1925		
District	Increase 1925 over 1924	Per cent of Increase 1925 over 1924
Eastern District (including Poca. Reg.)....	\$85,829,729	20.34
Southern District	24,414,320	19.14
Western District	31,683,281	9.17

As is hereinafter noted, over \$16,000,000 of the increase in net income in the western district is required to provide a return on the increase in property made through the medium of additions and betterments. No inconsiderable portion of such increase as there was in the West was the result of reducing expenses for maintenance, this accounting for almost half of the increase in net income, and the bulk of remainder resulted from increased efficiencies of operation. It will be observed that at the same rate of reduction in expenses and increase in property value through additions and betterments, it would require approximately 12 years for the cumulative effect to bring the western carriers up to the "fair return." No one has suggested that such reductions in expense can be continued indefinitely.

Causes of Unfavorable Showing in the West

Something has happened to the carriers in the western district, as compared with carriers in other portions of the United States, to impair their earning power. It is our contention under the evidence in this case, that the general freight rate levels in the western district are responsible for the relatively unfavorable results of operation in this district as compared with other sections of the United States and with the results of operation in this district prior to the war. There is no accurate gage for measuring general rate levels. The measure usually suggested, that of relative ton-mile earnings, embodies several frailties. An increase in the average length of haul will automatically result in lower average ton-mile earnings under a stable rate structure. The shifting of traffic as between commodities so as to result in a relatively larger movement of low grade and low rated commodities, produces the same result. Nevertheless, the measure of ton-mile earnings is of importance in indicating trends in the aggregate. In connection with other facts it has probative value.

AVERAGE REVENUE, MILLS PER TON MILE 1915 TO 1925

Year	Eastern District	Southern District	Western District
1915	6.46	6.39	8.78
1924	11.22	9.48	12.09
Ratio 1924 to 1915	173.84	148.36	137.70

The relative situation in the foregoing table is not the result of change in the average haul.

It also appears that there has been no such shifting of freight tonnage as between the grand divisions of freight traffic between 1915 and 1924 so as to result in this relatively unfavorable showing in the western district. That such shifting has not been sufficient in itself to produce these results, is shown by the table prepared by Mr. Wetling. It will be observed that the changes in the percentage relationship of the grand divisions of traffic have been relatively uniform in all of the districts. Thus the percentage of products of agriculture carried in all districts has shown practically the same relative decline and the products of manufacturers and miscellaneous the same relative increase, while the relative importance of the products of mines has remained substantially stationary. There has also been a decline in the relative tonnage of merchandise to the total in all the districts.

It will be observed that the commission adopted a rate base as of December 31, 1919, for the western district, which was \$718,454,872 less than the book cost of road and equipment as found by the commission. This was for all carriers in the western district, Class I, II, and III, together with switching and terminal companies. For Class I carriers alone the investment account, exclusive of materials and supplies and cash, showed on December 31, 1919, an aggregate figure of \$8,352,686,662. Since that time these Class I carriers (excluding switching and terminal companies), have, through the medium of subsequent additions and betterments, increased their investment accounts by \$1,394,010,101. During the same period there has been an increase in depreciation reserves to the extent of \$298,214,249. It is significant to note at this point that the methods which have been sought to be used by the state commissions in this case of bringing down to date the approximate value found in *Increased Rates*, 1920, *supra*, involve a depreciation of these additions and betterments below their actual cost, since only 91.8528 per cent of the present investment account, including these subsequent additions and betterments, is used as the present rate base. They also involve a method for computing an allowance for working capital which is substantially less than the total of \$440,289,661 shown to have been the amounts credited to materials and supplies and cash as of December 31, 1924, for Class I carriers in the western district.

Stabilization of Price Levels on Higher Plane

But aside from this, another important thing has happened since the commission in 1920 adopted the figure of \$8,100,000,000 as reflecting a value for rate-making purposes of carrier property in the western district. This is the legal effect which must be given in determining the value of public utility property at the increased price level, in so far as reproduction cost is used as a method of determining value. It will be recalled that in 1920 many economists believed that there would be a rapid recession of prices both in respect to commodities and labor costs. Up to that time the courts had not generally been willing to accept the increased price level as more than a temporary incident to the upheaval occasioned by the World War. Since that time we have entered upon a more or less stabilized relationship of prices upon a materially higher level than that which prevailed in 1914 and prior thereto.

Court Decisions Require Recognition

of Increased Price Level

Presented with this situation, the courts have consistently held that in so far as reproduction cost is to be utilized as measuring the value of public utility property, it must take into account the increased price level and the increased costs incident to reproduction of property now in order to arrive at a determination of present value for rate-making purposes. The first of these cases to reach the Supreme Court of the United States was *Galveston Electric Company v. Galveston*, 258 U. S. 388, decided April 10, 1922, wherein an allowance of 33 1/4 per cent in respect to increased reproduction costs over 1913 was not disturbed, it being stated that the court had "no reason to believe that the board would not give full and fair consideration to a proposed change in rate if application were now made to it," in the light of the prophecy that there would be a violent price recession subsequent to the cessation of hostilities and the negotiation of the peace treaty. A year later the Supreme Court of the United States in *Southwestern Bell Telephone Co. v. Public Service Commission*, 262 U. S. 276, reversed a judgment of the supreme court of Missouri which had sustained an order of the public service commission of the state reducing telephone rates. Among the errors pointed out by the Supreme Court of the United States was the following:

"Obviously, the commission undertook to value the property without according any weight to the greatly enhanced costs of material, labor, supplies, etc., over those prevailing in 1913, 1914 and 1916. As a matter of common knowledge, these increases were great. Competent witnesses estimated them as 45 to 50 per centum."

This same principle, that is, the necessity of reflecting the increase in value which has resulted from the increase in price levels in the United States, has been recognized and applied by numerous district courts and circuit courts of appeals in recent decisions.

The present record also shows that the Bureau of Statistics of the Interstate Commerce Commission in its statement No. 24351, adopted an equation factor of 189 as proper to use in equating 1923 costs of railroad operation to the cost in the test period under the federal control act.

Value Exceeds Aggregate Investment Accounts

In the light of this pronouncement by the courts as to the constitutional rights of the owners of public utility property to have consideration given to the increased price levels in respect to determination of value, it is submitted that under any theory the aggregate value as reflected by the investment accounts of the carriers in the western district constitutes a minimum value upon which their rate of return may lawfully be computed, and in respect to which general rate levels must be made pursuant to the interstate commerce act. Substantially all of these decisions have been rendered by the courts since the approximate valuation in the western district was announced by the commission in the course of its decision in *Increased Rates*, 1920, *supra*. In establishing the value of railroad property in that decision, the commission did not have before it these decisions of the courts. Regardless of what equation factors and price trends may be ultimately adopted, we submit that when recognition is given to the increase in price levels which the courts have found must be reflected in a value for rate-making purposes as of the present time, the right of the western carriers is established to earn a fair return on a value at least as great as that for which we are contending for the purposes of this application.

The rate increases which we are here seeking are conservative and are sought only for the purpose of enabling us to render the adequate and efficient transportation contemplated by the interstate commerce act, and desired in the interests of the public. Some of the questions which are inherent in the determination of a final value for rate-making purposes need not now be finally passed upon under our application here. We realize that they constitute difficult issues, involving mixed questions of law and fact, and that

it may be years before they are finally determined. Nevertheless, we submit that under any view the difference between the approximate valuation as determined by the commission in 1920 upon the basis of unit costs in 1914 and prior thereto, and the investment accounts of the carriers as of that time, will more than disappear when consideration is given to the principle which the courts have declared to be a matter of constitutional right.

Duty to Relieve Against Inadequacy

In these circumstances we submit that there can be no further duty resting upon these carriers to give further trial to the present general freight rate levels. The interstate commerce act does not contemplate that carriers in any rate group shall struggle along year after year with plainly inadequate earnings. The years of 1923, 1924 and 1925 show plainly the effect of the present general freight rate levels. The rate structure has been tried out and found wanting.

Where confiscation is alleged and it is reasonably clear that the rates in effect have failed to produce a fair return on the value of the property, there is no duty to experiment further with them. In such circumstances an obligation devolves upon the court to enjoin public authority from continuing them in effect.

5 3/4 Per Cent a Sub-Normal Rate

There is still another impelling reason for increasing the general rate level without further delay. This is the fact that the rate of return of 5 3/4 per cent defined by the commission as constituting the "fair return" under the interstate commerce act, is in itself a sub-normal rate. Certainly it is a minimum rate. For many years prior to the war the courts sustained charges of confiscation against rates producing less than 6 per cent. Subsequent to the increase in price level, the courts have repeatedly found 7 per cent and 8 per cent the minimum for measuring confiscation.

Hoch-Smith Resolution

Regarding the effect of the Hoch-Smith resolution the brief said in part, after an analysis of the agricultural situation:

From the foregoing analysis a number of conclusions may be suggested. Some of these are: (1) That there has been a substantial price advance in the important farm commodities since the Hoch-Smith resolution was first presented to Congress; (2) in respect to commodities which had lagged behind in the agricultural revival from the post-war depression, a marked price advance took place during the calendar year 1925 to the great benefit of the producer; (3) that there is always some variation between commodities from year to year and also between producing sections, induced in part by weather conditions, fluctuating demand, overproduction and many other causes which have no relation whatever to freight rates; (4) that under the present relationship intelligent and industrious farmers and livestock producers are in a relatively better condition than they were prior to the war, so far as their economic possibilities are concerned; and, (5) that there is substantial price competition as between the farm commodities themselves and as between different producing sections.

As to the future, there undoubtedly will be considerable price fluctuation, both as between commodities and as between producing sections. The price fluctuation within a given year will undoubtedly be greater than the entire freight rate paid on most commodities. Farm prices can not be stabilized through the medium of freight rates or otherwise, so long as these prices are determined by the forces of supply and demand. On the whole it appears from the statements of the United States Department of Agriculture, that in the case of the most important farm crops, there has been a complete restoration of farm prosperity and also that prices are being stabilized upon a relatively favorable basis.

Because Congress in the Hoch-Smith resolution directed the commission to prescribe on "the products of agriculture affected by that depression, including livestock," a freight rate readjustment so that they should move "at the lowest possible lawful rates compatible with the maintenance of adequate transportation service," some of the farm groups appearing in this proceeding seem to think that they have *ipso facto* escaped from contributing to any necessary increase in railroad revenues. They rely implicitly on what they believe to be a statutory edict. On the record, they usually omit all reference to the use by Congress of the word "lawful," or the phrase "compatible with the maintenance of adequate transportation service." They seem to prefer to think that they are the beneficiaries of something for nothing and that henceforth other industries and other shippers must bear their burdens.

We had supposed that by using the word "lawful," Congress intended to retain all of the tests prescribed in the interstate commerce act. So far as constitutional limitations are concerned, these would have obtained anyway. Congress could not have

contravened these limitations, which are, among others, that no rates may be made so low as to fail to pay expenses, including "overhead" and to contribute substantially toward a return on investment.

The brief filed by William Church Osborn, Grenville Clark and Joseph Schreiber, counsel for committees of security holders of Northwestern railroads, undertakes to show:

"(1) That the Northwestern railroads have for a period of years failed to earn anything approaching a fair return on their investment, computed on the lowest possible basis; that the confidence of investors in these carriers has already been largely impaired, and is likely to be wholly destroyed unless existing conditions are promptly remedied; that in consequence a condition exists seriously threatening the future maintenance and development of railroad transportation in the Northwest, a condition calling for prompt and adequate relief;

"(2) That a primary and major cause of the above described situation is a condition of unduly low rates, especially in that portion of Western Trunk Line territory north and east of the Missouri river—a rate condition which unjustly and illegally discriminates in favor of shippers in that locality as against shippers in other competing localities, and which unjustly and illegally discriminates against security holders of lines operating in that locality;

"(3) That the commission is under affirmative legal duties, promptly and adequately to correct the existing rate conditions, which discriminate between shippers and localities and adversely effect the Northwestern carriers;

"(4) That apart from any relief to the Western district as a whole, the commission should afford special relief to the Northwestern lines, through a mandatory order requiring all classes of freight rates in the eastern portion of Western Trunk Line territory to be revised so as to equalize them with corresponding rates for corresponding service in other portions of the Western district."

The commission is asked to "find as matters of fact: (1) That the unsound financial condition above described exists and that it threatens the maintenance of adequate railway service in the Northwest, (2) that the above described rate conditions, unjustly discriminating between localities and shippers, exist."

It is asked to conclude as matters of law that it is under a legal duty to correct these conditions: (1) in order to fulfil the basic purpose of the transportation act, and (2) in compliance with specific provisions of law forbidding discrimination between shippers and localities."

Report on Collision at Sacred Heart, Minn.

THE Interstate Commerce Commission, on February 22, issued a report, dated December 10, and signed by W. P. Borland, director of the bureau of safety, on a collision between a westbound passenger train and an eastbound freight, on the Chicago, Milwaukee & St. Paul, near Sacred Heart, Minn., on November 15, about 1:35 a. m., in which both trains were very badly damaged. The engineer of the passenger, one of the two engineers of the freight, a freight brakeman and a mail clerk, were killed and 21 persons were injured.

This collision occurred on a long straight line and both engineers had clear views of the bright headlight of the opposing train for about seven miles. The passenger train, No. 17 of 10 cars, had an order to wait at O'Connor

Siding, about five miles east of Sacred Heart, until 1:30 a. m. for the freight, which was No. 264. The freight, consisting of 95 cars and a caboose, drawn by two locomotives, also received the order, and it was understood; but the men in charge proceeded on the time of the passenger train, apparently depending on their ability to judge its distance by observing the headlight; but the trains had come very close to each other before the shortness of the distance was realized, and the freight was moving at 15 miles an hour or faster when it struck the passenger train. The trains met about three miles east of Sacred Heart station and over a mile west of O'Connor.

The report contains long abstracts of the statements made by the surviving trainmen, but the conflicting assertions and the questions which they could not answer in any satisfactory way, leave the reader with little information as to the real cause of their failure. The fireman of the passenger train said that his engineer had appeared to be in good physical condition; but he applied the brakes only a few seconds before striking the freight.

The leading engineer of the freight saw the headlight of the passenger when it was miles away, and then, later, the light disappeared from view; a phenomenon which might have been due to the undulating grade of the line, but the report says that all of the men were well acquainted with the road. The runner of the second engine in the freight cut in his brake valve and applied the brakes in emergency but not until too late.

In its conclusion the report defines the error of the men in charge of the freight as attempting to go to O'Connor Siding for train No. 17, an opposing superior train, without sufficient time; and the conductor and both engineers are held equally responsible.

The runner of the second engine of the freight appears to have been not very familiar with the road. However, he had a copy of the wait order and presumably was in possession both of a watch and a time table, "and had he desired he could easily have determined for himself whether or not there was time to go to O'Connor Siding for No. 17." The fireman of the second engine was a man of 11 years' experience and yet he thought his train could occupy the main track up to the time named in the wait order.

The report refers to the well-known collisions where engineers misjudged the distance of electric headlights which were reported three years ago, namely: Plains, Kan., April 19, 1922, and Thorpe, Wis., December 14, 1922.

Following this collision at Sacred Heart, tests were made with electric headlights, from which it was found that there was no dip in the grade which would prevent an engineer from seeing a westbound headlight constantly after moving eastward from Sacred Heart; and as to the ability of engineers to determine the location of an opposing headlight, that was found to be impossible. No apparent change in the location of the headlight or any increase in intensity could be discovered from the time it first appeared, more than four miles distant, until it was close enough to reflect on the rails at a distance of less than one mile; and even this reflection could not be seen by an engineer if his own headlight were burning. Neither would it be visible if each of the opposing engines was running on a slightly ascending grade.

This report says, in its introductory paragraph, that trains are operated on this line "by time-table, train orders and a manual block signal system"; but the detailed statement of facts indicates that the block system was not in effect, for the passenger train, westbound, having properly observed the wait order, was proceeding into the block occupied by the eastbound freight; and the passenger train is spoken of as superior to the freight.

Multiple Unit Cars for Illinois Central*

Design, operation and maintenance of equipment to be used for Chicago electrification

By W. M. Vandersluis

Electrical Engineer, Chicago Terminal Improvements, Illinois Central

THE initial tentative electric time-table for operation of electric trains on the electric lines of the Illinois Central in Chicago, provides for a total of 414 trains in a normal week day. Eighty-three of these trains will arrive and depart from Randolph street in the morning rush between 7.30 a. m. and 9.30 a. m. and 73 trains will arrive and depart from the same terminal between 4.30 p. m. and 6.15 p. m. the evening rush.

One condition to be met in the design of the electrical equipment required an appreciable saving in running time over steam operation. The average straight line acceleration rate is 1.5 m.p.h. per second, the braking rate 1.75 m.p.h. per second. Average voltage at the pantograph has been assumed at 1350, with a maximum of 1550 and a normal of 1500. Balancing speed on level tangent track at 1350 volts is 57 m.p.h. For speed determinations, wheel diameters are assumed as 36 in. average, 38 in. new and 34½ in. scrapping size.

Lengths of run between stops vary from 0.34 miles in local service to 14 miles in special service. The average runs between stops are 0.6 mile for locals, 0.95 miles for expresses and 1.7 miles for the specials. From an operating standpoint, it is necessary to have identical equipment for all services, so that motor equipment must stand the maximum service without injurious heating. The South Chicago local is the determining factor.

Orders have been placed for 130 motor cars and 85 trailers, which, with the 45 cars now in steam service, to be converted into trailer cars, will make available 130 two-car units for initial suburban service.

Mechanical Features

Motor car and trailer bodies are alike with the exception that the motor car underframe is designed for carrying the control equipment and the roof is designed for carrying two pantographs. Trap doors and steps, as provided for the original 45 cars are omitted from the motor car and are installed only on the end of the trailer car adjacent to the motor car. As high platforms are being installed at all suburban stations, these trap doors and steps, one set per two-car unit, will be available for emergency use.

The cars are 72 ft. 7½ in. long over buffers, 10 ft. 6 in. wide over platforms at vestibule side door, and seat 84, 68 in cross seats and 16 in the four longitudinal end seats. Aisles are 3 ft. 0-½ in. between the seat backs.

The body of the car is steel, inside sheathing of pure aluminum, roof sheets and lower deck sheets of aluminum alloy; the doors, of which there are eleven per car, are made of sheet aluminum. Copper bearing steel is used for all steel in the car bodies.

The motor car trucks are equipped with two motors each and are of the swing bolster, equalized type with a wheel base of 8 ft. 3 in. The truck frames with pedestals, transoms and brake supporting lugs are integral steel castings. Wheels (new) are 38 in. in diameter of rolled

steel. Clasp brakes are used on both motor and trailer trucks. Trailer car trucks are similar to the motor trucks, but with a wheel base of 6 ft. 3 in. and 33-in. wheels.

Collapsible safety gates are provided between cars to prevent possible accidents from passengers falling between them. For the convenience of the passengers, all cars are equipped with diaphragms to permit easy access from car to car without exposure to the weather.

Electrical Equipment

The motors have an hourly rating of 250 hp. and a continuous current carrying capacity of 210 amperes. They are 750-volt motors insulated for 1500 volts with two permanently in series on each truck.

Two pantographs are provided for each motor car, one over each truck center. Their supporting structure is provided with double insulation. The operating range is from 16 ft. to 24 ft. These are spring raised, air lowered, and all pantographs in a train may be controlled from any cab. Selector switches for the pantographs on each car are provided.

One control cab is provided for each car, located so as to be at each end of the two-car unit. A door encloses the equipment when the cab is not in use and allows full use of platform. This door forms a cab for the motorman when opened. The space in the body bulkhead opposite the control apparatus contains a folding seat for the motorman.

A 3½-kw. 1500 volt motor-generator set is installed on each motor car to supply energy at a nominal voltage of 32 for the control equipment, electro-pneumatic brakes, lighting circuits, door operating engines, train signals, door signal system, and for charging the battery which carries the low voltage load should the motor-generator set be inoperative.

This unit has a double commutator and has the generator enclosed in the same frame. It will run continuously with pantograph raised and the 300-ampere battery, carried for convenience, on the trailer car, will float on the line. A regulator of the carbon-pile type regulates the voltage and load taken by the set. Separate carbon-pile regulators control the lighting circuit voltage in each car.

The control equipment provides automatic acceleration by use of electro-pneumatically cam operated switch groups. Two independent electro-pneumatic line switches in series open the motor circuits and relieve the cam operated switches from opening circuits under load.

Automatic acceleration is obtained through current limit relays, but provision is made for positive manual operation step by step, if desired.

The control of the traction motors provides seven full field series control steps with five full field parallel and one normal field parallel step. Shunt or T-type transition from series to parallel is used. The master controller has a safety type handle, which will open the main circuit and set emergency brakes if released, except when

*Abstract of a paper read before the Western Society of Engineers in Chicago on March 9.

the reverser handle is in the "off" position. It is also interlocked with brake apparatus so that power may not be applied unless the brakes are cut in service from the same cab.

Heating Apparatus

Heating is supplied at 1500 volts, with five car body circuits and one cab heater circuit per car. Car body units are of 750 watts each, with a total of 29 kw. per car. There are two coils per heater. Normally one element under each of the 34 cross seats and all under the longitudinal end seats may be energized. At low temperatures, or when needed to quickly heat the cars, the additional coil under each cross seat may be used. All circuits of heaters in the car body are controlled automatically by two thermostats of different temperature settings, subject to selection by trainmen on operating instructions.

The heating elements are of the enclosed type, the heater wire being embedded in an insulating compound having a high fusing point enclosed in a metal shell. Further protection is provided by the heater case designed to prevent the insertion of foreign objects.

Couplers

Each end of the motor car-trailer unit is equipped with an automatic mechanical, air and electric tight-lock coupler with a 6¼-in. x 8-in. friction spring draft gear and ball and socket anchorage. The draft gear is designed for a maximum curvature of 33 degrees. These couplers are self centering and units may be coupled or uncoupled by one man from any adjacent cab. They also may be operated by hand.

The automatic coupler contains the brake pipe and main reservoir balance pipe air lines and 39 contacts for the low voltage control circuits. The 1500 volt circuits are not bussed through the train. An interlocked switch to short circuit the door signal system on uncoupled ends of trains is included.

Couplers between cars of a unit are similar, but with a 1500 volt bus for heaters only, and must be hand controlled from under the car, as the motor and trailer cars will not be separated except in shops or for emergency purposes.

Brakes

Electro-pneumatic brakes will provide simultaneous application on all cars of a train. This brake equipment functions pneumatically at the same time as it functions electrically, so that if the control voltage fails, the brakes will operate as standard automatic air brakes, without requiring any additional attention by the motorman.

Service braking is at the rate of 1.75 m.p.h. per second and emergency braking at not less than 3.00 m.p.h. per second. Normal brake pipe pressure is 90 lb. A 1500 volt d.c. motor driven air compressor having a piston displacement of 35 cu. ft. per minute, with two 16-in. x 60-in. main reservoirs is installed on each motor car. Governors operate from 100 to 115 lb. per sq. in. and all compressors in a train start when any governor cuts in, through a synchronizing train line circuit operating at control voltage.

Door Controls

The four vestibule side doors are operated by 32-volt motor-operated door engines.

Control stations are provided just outside of car end doors, containing a master switch which controls all four doors on one side of the two-car unit and a switch for the individual door adjacent to the station. The four doors can be controlled from any one of the four control switches. Duplicate switches are provided on the oppo-

site side for similar operation of the four doors on the opposite side of the unit. In addition, when the motorman's cab is in use, the control of his outside door is automatically taken away for the other switches and he can control this door from a separate switch in the cab.

Watt-hour meters are installed in the motor circuits of each car with remotely operated dials in each cab. These meters have inspection dial to permit shopping on the kilowatt-hour basis if desired.

Electrically operated window wipers are used for each motorman's front window.

Aluminum alloy conduit, outlet boxes and wiring devices are used whenever thought practicable with a view to further reducing the car weight.

The motor car without passenger load weighs, completely equipped, 141,000 lb., and the trailer car 85,000 lb.

Inspection and Repair Facilities

In addition to the inspection of the multiple unit equipment at terminal points to take care of minor repairs and emergency adjustments, it is planned to have inspections made after every 1,500 miles of run. As the daily mileage per unit is about 100, facilities are being provided for light inspection of all cars at least twice a month, initially.

A study of the time necessary for the light inspection shows that this may be done in about 4½ hours or during the day layover at Randolph street between peak hours.

To take care of this work a light inspection building 76 feet by 480 feet, 28 feet high, is being built in the space nearest to Randolph street which is available, which is at 16th street. This building will have four tracks with a capacity of six cars each. Concrete inspection pits are being installed for all tracks. Runways adjacent to top of cars will facilitate pantograph inspection and tests.

Equipment consists of an air compressor for blowing out electrical apparatus, portable car jacks, electric lift truck, relay testing devices and portable transformer outfit for high voltage tests, as well as miscellaneous small tools. A storeroom for small repair parts and complete oil storage facilities are included.

Heavy inspection of multiple unit cars is considered advisable every 6,000 miles, or every fourth light inspection. The time required is estimated at 16 hours for each motor car-trailer unit. The cars must be sent to a shop and all apparatus covers removed so that detailed inspection can be made and the apparatus cleaned, oiled and blown out with air to remove metallic dust and other dirt accumulations.

A complete overhaul is planned after every 35,000 miles of service, or one a year. At that time heavy mechanical repairs can be made to car bodies and trucks and cars painted or varnished as necessary. The time required in the shop is estimated at about three weeks.

For the heavy inspection and overhaul work, an electric shop is being built at the main shops of the system at Burnside, near 95th street. This is designed as a permanent building and fits in with the general scheme of extension of the present passenger car facilities. It consists of a heavy inspection shop 86 ft. by 350 ft., 29 ft. high, with four tracks, each to handle four cars. Concrete pits are laid out under each track and the whole shop is served with two 25-ton traveling cranes with main and auxiliary hoists.

Adjacent, with a common partition, is a repair shop for electrical equipment only, 70 ft. by 350 ft., served with a ten-ton traveling crane. A testing shop with office on second floor will be located in one end of the repair shop.

The shop equipment will consist of the necessary tools

and fixtures for repairs to motors, control equipment, air compressors and all accessories including storage battery charging. Electrified yard tracks for storage and testing are being built in connection with this repair shop.

It is the intention to use the heavy inspection building as a stripping and assembling shop for the cars, which, after removal of the electrical equipment, will be sent to the regular shop, near by, for necessary complete overhauling or repairs, returning to this shop for mounting of the electrical equipment when overhauling has been completed.

At a later date, it is the intention to build a stripping and assembling shop, truck shop and wheel shop in connection with these new buildings.

Conclusion

The work of electrification is well under way. The foundations for the structures are 96 per cent complete. Structures have been erected on the branches and from Matteson north to about 43rd street. The overhead construction is about 50 per cent complete. All materials have been ordered and the principal contracts for installation on the balance of the work have been let. Conduit work is nearly finished. Cable work and bonding are under way. Motor and trailer cars are on a quantity production basis with the first motor cars and trailers ready for delivery. Plans for instruction of motormen and trainmen are completed. The Edison Company is well along with substation work and are now ready to provide a.c. service at two substations and traction service for the test track from one.

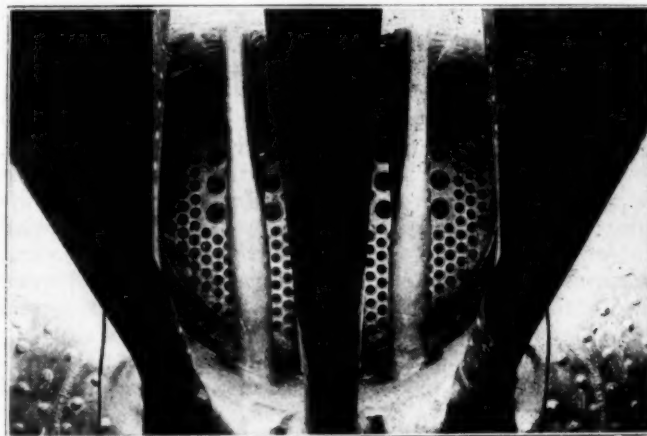
Thermic Syphons Used in Combustion Chambers

THE trend in locomotive boiler design has for years been towards proportionately larger grates and fireboxes in order to obtain greater capacity and more efficient transfer of heat from combustion gases to boiler water. One factor which, in addition to other im-

equipment on 1906 locomotives for 78 railroads in this country and abroad.

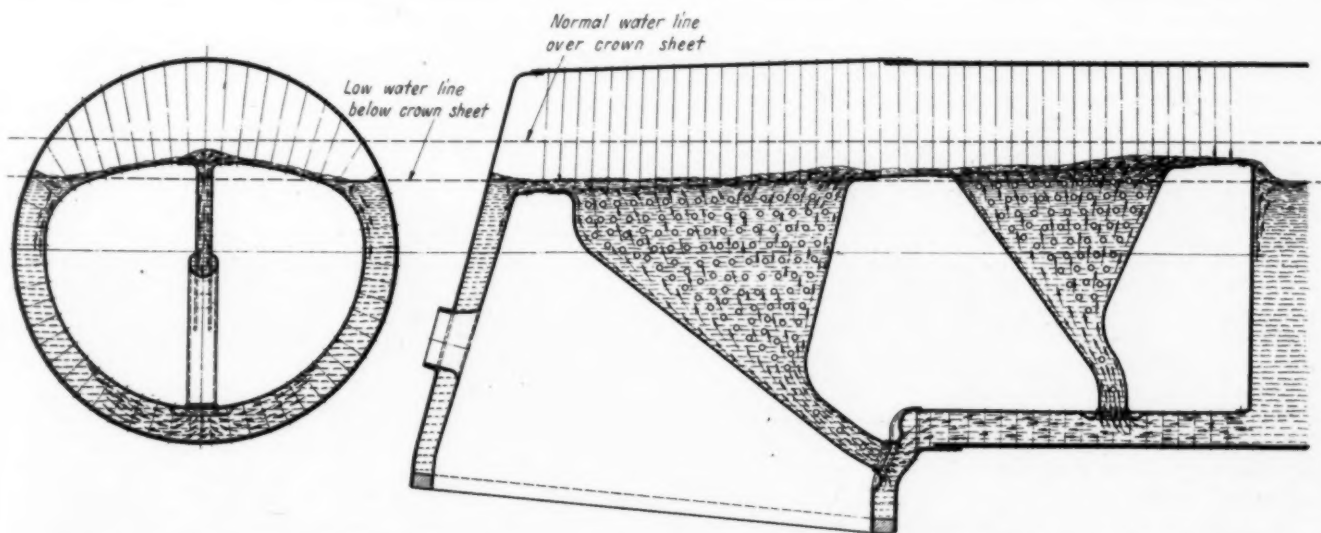
One or two units of Thermic Syphons are now being installed in the combustion chamber, thus adding to the heating surface in a location of great advantage but, more particularly, serving as a feature of additional protection in the event of low water.

Thermic Syphons have prevented boiler explosions in several cases of low water, there being six defi-



Syphon Installation with Two Units in a Combustion Chamber

nitely reported with water down from $3\frac{1}{2}$ to 6 in. below the high point of the crown sheet. The pumping action of the Syphons in such cases causes the water to continue flowing from the Syphon opening over the crown sheet. This overflow serves to prevent general overheating of the sheet, which is further protected by the girder like support rendered by the Syphon. A small portion of the sheet ahead of the Syphon becomes heated, allowing one or more radials to pull through thus providing a gradual release of the pressure. Five of the above cases were on straight flue sheet boilers with approximately 18 in. of space between the flue sheets and Syphons. A recent case of low water occurred on a combustion chamber boiler, Syphon-equipped, with



View Showing How Thermic Syphons Stimulate Circulation and Protect Crown Sheet in Event of Low Water

portant advantages, has contributed materially to enlarged firebox heating surfaces while taking but a small proportion of the total firebox volume above the arch, is the Nicholson Thermic Syphon and, to date, the Locomotive Firebox Company, Chicago, has placed in service Syphon

a space of 43 in. between the flue sheets and the Syphons. Due to a larger exposed area of the crown sheet, 28 radials pulled through the sheet but no rupture occurred.

With the continued rise of the crown sheet, as in a combustion chamber design, it is a question of how long

a chamber may be protected by a firebox Syphon. In the above case, the chamber was short, only about three feet, but many boilers have chamber lengths up to seven feet or more. By the addition of Syphons to the combustion chamber, an overflow effect, to protect the crown sheet in event of low water, is furnished in the same relation to location of flue sheet as on straight flue sheet boilers.

A combustion chamber application, in combination with the usual firebox Syphon, is shown in the drawing. Locomotives having this design modified to include two Syphons in the combustion chamber as shown in the photograph, are giving excellent performance.

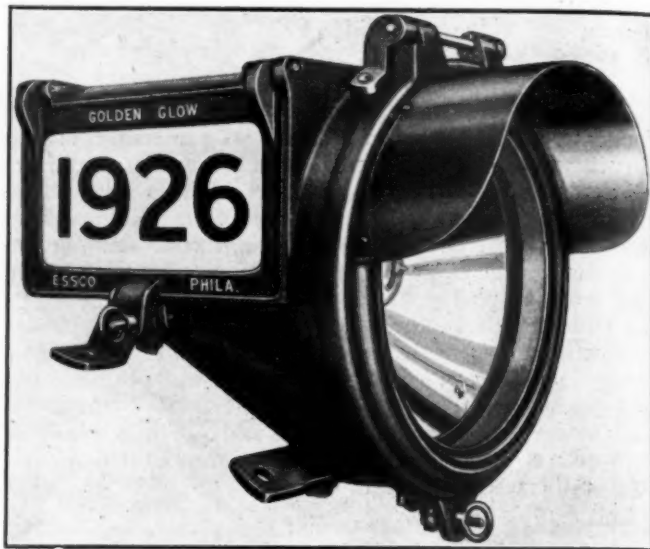
It will be noted that the same design as the firebox Syphon is used in combustion chambers, being generally triangular in shape; made of firebox steel, with a 3-in. width of water space; staybolted in the usual manner. It is welded to the crown sheet in a similar fashion and the lower attachment employs a standard diaphragm welded to the bottom of the chamber. The structure, therefore, becomes a strut or column between the top and bottom sheets of the chamber with a very long top bearing and a comparatively short vertical dimension.

It is a known fact that some difficulty in the maintenance of combustion chambers has been experienced since their inception, which may be due to slow circulation of the boiler water. One purpose of locating Syphons in the combustion chamber is to draw water from around the chamber and discharge it above the crown sheet, facilitating the general circulation. That such a strong upward current through such Syphons exists has been proved by water marks on plates especially placed over them for record.

Another advantage lies in the addition of heating surface. In the installation shown, the heating surface of firebox and combustion chamber is 329 sq. ft. The firebox Syphon heating surface has 90 sq. ft., an addition of 27 per cent. The Syphon located in the combustion chamber has 20 sq. ft., or 6 per cent more, a total addition to the firebox and combustion chamber of 110 sq. ft., or 33 per cent of heating surface. When desirable, two Syphons can be applied to the combustion chamber, making a total of 39 per cent.

Headlight for Rail Motor and Multiple Unit Cars

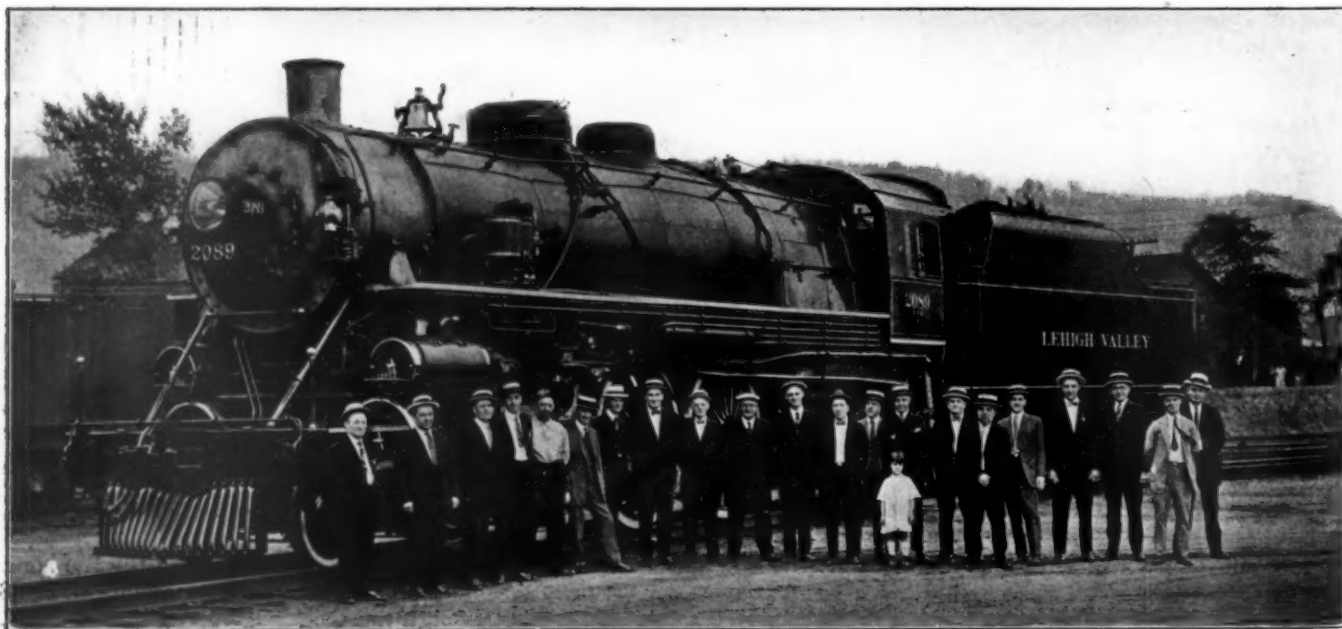
THE Electric Service Supplies Company, Philadelphia, Pa., has placed on the market a new type of "Golden Glow" headlight with mirrored glass reflector which is especially designed for use on self-propelled rail cars, multiple unit cars and similar passenger equipment. Being designed for installation on the roof of such equipment the body of the headlight is



The Headlight Case Is an Aluminum Casting with Bronze Fittings

tapered and the feet of the headlight are made so that they will conform to the curvature of the roof.

This new headlight is known as type RA-128. The main body or case is made of one integral cast aluminum shell. Front and side doors also are aluminum and are fitted with gaskets. Fittings are of bronze.



Foremen of the Lehigh Valley Sayre Shops

Accident Investigations—April May and June

THE Interstate Commerce Commission has issued its quarterly summary of accident investigations (No. 24) for the three months ending with June, 1925.*

This bulletin covers five collisions and 15 derailments, as follows:

ACCIDENTS INVESTIGATED, APRIL, MAY AND JUNE, 1925

1145 Denver & Rio Grande Western..Concrete, Colo.....	Apr. 4	D
1146 N. Y., New Haven & Hartford..Hartford, Conn.....	Apr. 4	C
1147 Erie	Apr. 6	D
1148 Erie	Apr. 6	C
1149 Chicago, Milwaukee & St. Paul..Rahway, Mont.....	Apr. 22	D
1150 Atchison, Topeka & Santa Fe..Sorrento, Calif.....	Apr. 28	D
1151 Chesapeake & Ohio.....Quincy, Ky.....	Apr. 29	D
1152 St. Joseph & Grand Island.....Summit, Kan.....	Apr. 30	D
1153 Pennsylvania	May 14	D
1154 Florida East Coast.....Dupont, Fla.....	May 17	D
1155 Quincy, Omaha & Kansas City..Kirkville, Mo.....	May 22	D
1156 Erie	May 24	D
1157 International-Great Northern..Longview Jct., Tex.....	May 28	D
1158 N. Y., New Haven & Hartford..Worcester, Mass.....	May 29	D
1159 Louisville & Nashville.....Paris, Tenn.....	June 6	C
1159 Chesapeake & Ohio.....Converse, Ind.....	June 8	D
1161 Del., Lackawanna & Western..Hacktstown, N. J.....	June 16	D
1162 N. Y., New Haven & Hartford..Readville, Mass.....	June 17	C
1163 Cleve., Cin., Chic. & St. Louis..Grants, Ohio.....	June 18	D
1164 N. Y., Susquehanna & Western..Green Pond Jct., N. J.....	June 23	C

Abstracts of Reports

Denver & Rio Grande Western, Concrete, Colo., April 4, 2:20 a.m.—Eastbound passenger train No. 16, moving at about 35 miles an hour, was derailed at a facing point switch which the inspector concludes was cocked or partly open. Nothing was discovered as to how the switch came to be in this dangerous condition. The locomotive was overturned and the engineman was killed.

New York, New Haven & Hartford, Hartford, Conn., April 4.—Rear collision of freight trains, within yard limits, due to failure of engineman to maintain a proper lookout. One employee killed. The engineman had received a long train order and appears to have withdrawn his attention from the signals and the track while reading it; conduct which is characterized by the report as gross carelessness. The flagman of the train ahead did not have the prescribed flagging equipment, but the report holds that his stop signals, if seen and heeded, would have been sufficient.

Erie, Great Bend, Pa., April 6.—Eastbound freight train No. 188 moving at between 40 and 45 miles an hour, on a curve of two degrees, was derailed and several cars badly damaged. The locomotive and eight cars ran some distance after the ninth car had been derailed and were thrown off at a facing-point switch. The locomotive was overturned. The ninth car swerved to the left sufficiently to foul the westbound track and passenger train No. 453 ran into the wreck. The fireman of the passenger train was killed and seven passengers and four employees were injured. The inspector was unable to discover the cause of this derailment.

Erie, Goshen, N. Y., April 6.—Westbound freight extra 3159, moving at about six miles an hour, 1¼ miles west of the station, having just moved out from the side track, was run into at the rear by westbound freight extra 3185, consisting of a locomotive, two cars and a caboose. The caboose of the leading train was wrecked and a brakeman

riding on it was killed. Both freights had taken the side track at Goshen for westbound passenger No. 7. Freight 3185 had done some switching and had backed out upon the westbound main track east of the station, after the passage of No. 7; and then, moving in violation of a dwarf signal which indicated caution, and also running past an automatic signal indicating stop, not far behind No. 3159, ran into the other train at about 20 or 30 miles an hour. The engineman of 3185 said that he had no knowledge that there was another freight in the vicinity, and he thought he was following train No. 7. There was a curve in the line, so that he could not see the stop signal until he came near to it, but the fireman could have seen it for 1,650 ft. He, however, was busy oiling the stoker. The inspector also blames the flagman of the leading train for not placing torpedoes or fusees as is required by the rule when a train moves out of a siding as was done in this case. The conductor of 3159 also was neglectful in not instructing the flagman to protect the train.

Chicago, Milwaukee & St. Paul, Rahway, Mont., April 22.—Eastbound passenger train No. 18, moving at about 25 miles an hour, broke through a bridge which had been weakened by fire and the engineman and fireman were killed; one passenger and one mail clerk were injured. The weakened timbers of the bridge were concealed by the metal sheathing. The cause of the fire was not discovered. No train had been over the road for about 12 hours. The accident occurred at 10:12 a.m. and the track foreman had not been over the line since the day before. The inspector finds that the rules for inspection of track and roadway had not been definitely formulated and that, therefore, a portion of the responsibility for this accident "must rest with the railway company for failure to maintain adequate track inspection."

Atchison, Topeka & Santa Fe, Sorrento, Cal., April 28.—Eastbound passenger train No. 76, moving at from 35 to 50 miles an hour, was derailed on a curve of nine degrees, and the locomotive was overturned. The engineman was killed and 63 passengers and five employees were injured. The inspector believes that the cause was excessive speed, he having found no defect in track, locomotive or cars. The manner in which the locomotive and cars came to rest indicated that the speed had been high.

Chesapeake & Ohio, Quincy, Ky., April 29.—Eastbound passenger train No. 2, consisting of locomotive No. 465 and eight cars, moving at about 50 miles an hour, was derailed at a point where track repairs were in progress and the locomotive and first four cars were overturned. The engineman was killed and 29 passengers, five employees and five other persons were injured. The inspector finds the cause to have been insecure track, insufficiently ballasted and with ties insufficiently spiked; and puts the responsibility on Track Foreman Arthur, a man of long experience, who has been in charge of an extra gang for two years. He had 35 men at work at this point. None of the testimony summarized in the report admits that conditions were unsafe, or that the passenger train ought to have been flagged.

St. Joseph & Grand Island, Summit, Kan., April 30.—Westbound passenger train No. 1 moving at from 20 to 35 miles an hour was derailed at a misplaced switch and

*Previous quarterlies noticed in the *Railway Age* as follows:

No. 23, Sept. 26, 1925, p. 560	No. 19, July 19, 1924, p. 104
No. 22, Aug. 15, 1925, p. 322	No. 18, July 5, 1924, p. 11
No. 21, Mar. 21, 1925, p. 799	No. 17, July 5, 1924, p. 11
No. 20, Oct. 25, 1924, p. 759	No. 16, Sept. 15, 1923, p. 479

the locomotive was overturned. The engineman was killed and one passenger and one employee were injured. The condition of the switch indicated that it had been maliciously tampered with, and a man was taken into custody, soon after the derailment, who is said to have confessed the crime. The inspector notes this fact and says that "an adequate block signal probably would have prevented this derailment; and an adequate automatic train stop would have prevented it."

Pennsylvania, Martinsville, Ill., May 14.—Eastbound passenger train No. 6, drawn by two locomotives, moving at about 60 miles an hour, was derailed by a broken rail, making a very bad wreck; both engineman and both firemen were killed as was also one other person; and 13 persons were injured. The broken rail was the lead rail of a switch; it had been weakened by the drilling of five bolt holes in the web and, at some time prior to the derailment, there had occurred a partial rupture of the web. The weakness caused by the drilling was responsible for the breaking of the rail.

Florida East Coast, Dupont, Fla., May 17, 10:30 p.m.—A northbound freight train consisting of two locomotives, 83 cars and a caboose, was derailed at a loose facing point switch while moving at about 25 or 30 miles an hour, and the two locomotives were overturned; three cars were destroyed and many others damaged. One engineman was killed and four other trainmen were injured. The switch had been run through by a southbound passenger train, but the light continued to show all-clear (green). The engineman and fireman of the passenger train are held at fault for running through this switch when, undoubtedly, its light showed red; they apparently did not look at it and continued on their journey without knowing what had happened. The engineman claimed to have seen a green light before he started forward from the station, but the inspector thinks that this must have been the light of another switch nearby. The fireman offered as a part of his excuse that he had been busy preparing some boiler compound, the engine having made trouble by foaming. The switch had been left wrong in the face of the passenger train by the negligence of men connected with a preceding northbound freight, which had entered the siding at this point, to meet the passenger train. The flagman of this freight, having been sent back remained out until the passage of the passenger train, having failed to hear any whistle signal recalling him; when he did start in, he assumed, because of the passage of the passenger train, that his own train was clear of the main track and the switch properly attended to; and he claims that at that time the switch showed green. He, therefore, assumed that it had been set straight by some member of the crew of the passenger train.

Quincy, Omaha & Kansas City, Kirksville, Mo., May 22.—Eastbound passenger train No. 6, moving at about 30 miles an hour, was derailed at a split switch and the locomotive was overturned. The fireman was killed and one passenger and two employees were injured. The switch had been run through by a westbound train, several hours prior to the derailment, and the conclusion of the inspector is that the track foreman and one of his men, who had used the switch, had left it set for the siding. They had used the switch for moving their work cars (empty) into the siding, contrary to the rule requiring that in such cases the cars be lifted from one track to the other. The engineman of the train, however, is held at fault, as the switch target showed red and he had an unobstructed view of it.

Erie, Campville, N. Y., May 24, 2:06 a.m.—Westbound passenger train No. 5, moving at about 50 or 60 miles an hour, was derailed on a curve of three degrees and the

locomotive was overturned. The engine fell against the fifth car in an eastbound freight train and derailed a part of the freight train, itself being finally overturned on the north side of the westbound track. In the freight train, the fifth car and the six following cars: the 13th car, the 25th to the 28th inclusive, and the 52nd and 53rd cars, were derailed. Seven of these freight cars were demolished. One mail clerk and two employees were killed and six passengers, one mail clerk and two Pullman employees were injured. The employees killed were the engineman and fireman of the passenger train. Careful examination of the passenger locomotive and of the track disclosed nothing to explain the accident, and the inspector reports that the cause was not definitely ascertained.

International-Great Northern, Longview Junction, Tex., May 28.—Northbound passenger train No. 2, moving at full speed, was derailed on a curve of two degrees; and the locomotive was overturned and wrecked. One passenger, the engineman and the fireman were killed, and 25 passengers and one employee were injured. Several cars were badly wrecked, and the inspector believes that the derailment was due to the uneven surface of the track, together with a super-elevation not sufficient for the operation of trains at unrestricted speed. Some of the witnesses thought the speed had been as high as 60 or 65 miles an hour, but the report says that the engineman was not at fault, since there was no rule restricting speed. The elevation of the outer rail was found very uneven. Officers of the road said that the elevation was intended to be $2\frac{5}{8}$ in.; but the inspector, calling attention to the standard of the American Railway Engineering Association, which is $4\frac{3}{4}$ in. for a curve of two degrees to provide for a speed of 60 miles an hour, says that the margin of safety was probably entirely obliterated. A variation of three inches was found within a distance of 250 ft.; and the lowest found was $1\frac{3}{8}$ in.

New York, New Haven & Hartford, Worcester, Mass., May 29, 1:05 a.m.—Westbound passenger train No. 93, the State of Maine Express, moving at about 20 miles an hour, was derailed at a facing point switch and the locomotive was overturned. The fireman was killed and one passenger and one employee were injured. After the accident, the switch point on one side was found slightly open, and the lock was hanging at the end of its chain. The inspector found no defect in cars, locomotive or track, except the loose switch. The trackmen and the signal maintainers had worked at the switch the previous afternoon and they were questioned as to whether it had been left open and had been run through by an eastbound train, but no conclusion was reached; and nothing was learned as to why the lock was out of place. The automatic signal east of this switch indicated stop continuously from 9 p.m. until the time of the accident, no westbound train going over the line in the meantime; but this indication may have been due to a broken bond wire.

Louisville & Nashville, Paris, Tenn., June 6, 7:58 a.m.—Southbound local freight train No. 125 ran past the station at which, by a dispatcher's order, it should have met northbound freight No. 122, and collided with that train while moving at about 25 miles an hour, the other train also having been traveling at about the same speed. Both locomotives were overturned and 14 cars were wrecked. The engineman and fireman of the southbound train, two track laborers riding on that train and the engineman of the northbound were killed, and two employees were injured. The southbound train, which was at fault, had begun its trip only eight minutes before. The conductor acknowledged that he forgot the meet order. He did not show it to any brakeman, but he claims that he left it on the seat in the caboose, where the brakeman could read it if he desired; and the evidence

indicates that the engineman, who was killed, took no pains to show the order to the fireman or to any one else. The report censures severely the indifference of the brakemen, and presumably the fireman, in making no effort to see the order or ascertain its contents. The report quotes, from Rule 210, the injunction to fireman and brakeman to ask for orders when their superiors fail to show them.

Chesapeake & Ohio, Converse, Ind., June 8, 7:40 a.m.—A westbound freight train was derailed on a curve of seven degrees, 30 minutes, while moving at from 15 to 30 miles an hour; and a dozen cars were badly broken up. Twelve employees were killed and five were injured; 11 of the killed being track laborers who had been working on the track and who were caught between the cars and the abutment of an overhead bridge. After a careful study the cause of this derailment was believed to have been spread rails. The repairers had pulled the spikes from every other tie for a considerable distance and one-sixth of the ties were split, broken or decayed. Also there were some irregularities in gage and alignment.

Delaware, Lackawanna & Western, Hackettstown, N. J., June 16.—An eastbound extra passenger train, running at about 50 miles an hour was derailed by gravel which had been washed upon the tracks at a highway crossing; the locomotive was overturned and the first coach lodged partly on it; 45 passengers, one porter and four employees were killed and 23 passengers were injured. This accident was reported in the *Railway Age* of June 20, page 1537, and August 15, page 325.

New York, New Haven & Hartford, Readville, Mass., June 17, 6:25 a.m.—An eastbound freight train ran into the side of a preceding eastbound freight train, within yard limits, making a bad wreck and killing the conductor and one brakeman of the leading train. The colliding train had passed a fixed signal which gave a clear indication, but the rule (which the engineman admits he understood) provides that this signal merely indicates that a route is set up, not that the track is clear. The engineman had assumed that the train ahead was clear of the track to which he was destined when, in fact, it was not. Also, it appears that the conductor of the leading train apparently had told the tower man that his train was clear of the track on which the following train was to run, without knowing certainly whether or not this was the case. The signal department had, about a year ago, recommended that the signal above referred to should be interlocked with the switches ahead of it.

Cleveland, Cincinnati, Chicago & St. Louis, Grants, Ohio, June 18, 4:44 p.m.—Passenger train No. 3, enroute from Toledo to Cincinnati, moving at high speed, was derailed while running from the main track to a siding through a No. 10 turnout, and the tender and the first car were overturned. The leading truck and the first pair of driving wheels of the locomotive remained on the rails. One passenger and one other person were killed and 79 passengers and two employees were injured. An order had been issued about 1 p.m. by Train Dispatcher Clark requiring the long siding at Grants to be used as a main track for a period of about four hours, because of repair work going on at that point, and the cause of the collision was the failure of the dispatcher to send this order to this particular train. The train approached at about 60 or 70 miles an hour, and the engineman is held at fault for not sooner seeing the switch target, which was visible for about one-half mile. The operator at Grants, having had some conversation with the first trick operator about the possibility of forgetfulness on the part of enginemen was outside his office, with a flag in his hand, when the passenger train approached, and his hand motions with the flag appear to have been the first warning

that was heeded by the engineman. The mistake of the dispatcher was in addressing the order to "all freights" instead of "all trains." For movements in the opposite direction, the order about using the side track was addressed to all freights and this is the only explanation of the cause of the error. The inspector criticizes the use of the terms "passenger" and "freight" instead of "first class," "second class," etc. The report does not explain why such orders were not in all cases addressed to all trains.

The fireman had a better view of the switch than the engineman but the fireman "was wetting down the coal" as he approached Grants. The accident occurred one hour 44 minutes after second trick dispatcher Passman came on duty; had he made a careful check of the train orders outstanding, he might have discovered the error.

Dispatcher Clark began service as an operator in 1913 and was promoted to dispatcher in 1923.

New York, Susquehanna & Western, Green Pond Junction, N. J., June 23, 3:25 a. m.—Two box cars left on a track in the yard not properly secured, ran out on the main line and collided with a freight train moving in the opposite direction; the fireman of the train was killed and five employees were injured. The inspector could not decide whether the brakes on one of the two box cars had been knocked loose when the other car was coupled to it, or had failed to hold the car because not set sufficiently tight.

Accidents of this kind were found to have been somewhat frequent heretofore and the provision of better derailling safeguards is recommended.



International

Fog Signaling in England

In foggy weather trackmen are stationed at fixed signals to place torpedoes on track when signals are at stop or caution. This may be dangerous in very foggy weather, hence the use of the "placer" shown; it is worked from the tower or by a ground lever.

General News Department

The Norfolk & Western has granted a wage increase of \$4 a month to its clerical employees and an increase of 2 cents an hour to car inspectors.

Hotel Ambassador, Los Angeles, Cal., is the location selected for the regular fall meeting of the Signal section of the American Railway Association; and the time will be Wednesday, Thursday and Friday, September 8, 9 and 10.

The Interstate Commerce Commission has modified its second train control order, of January 14, 1924, to authorize the Louisville & Nashville to make its installation between New Orleans, La., and Mobile, Ala., instead of that portion of its line prescribed by the order.

The Interstate Commerce Commission has modified its second automatic train control order to authorize the Chicago & Eastern Illinois to install an automatic train control or train stop device upon that portion of its line between Danville, Illinois, and Clinton, Indiana, in lieu of the territory specified in the order of November 2, 1925.

The locomotive shops of the New York, Chicago & St. Louis at Frankfort, Ind., were mostly destroyed by fire on March 9; estimated loss, including damage to locomotives, \$500,000 or more. The fire is said to have started from an "oil burner" in the round house. The round house was a new one. Press reports say that about 600 men will be temporarily thrown out of work.

The first aid school of the Safety division of the Milwaukee Association of Commerce is now holding its third annual term, the last meeting being scheduled for April 1. Each meeting is addressed by a leading physician or other specialist. The attendance this year is about 1,700 men and women, sent by 175 leading industrial and commercial organizations of Milwaukee.

Representatives of railroads operating more than 85 per cent of the mileage in Eastern territory at a meeting in New York on March 8 agreed to act jointly in appointing a committee to negotiate a new wage contract with the Brotherhood of Railroad Trainmen and the Order of Railway Conductors. Similar action was taken by the Western roads last week, as announced in the *Railway Age* of March 6.

Officers and members of the train and engine service brotherhoods have organized the American Home Builders, Inc., with headquarters at Cleveland, Ohio, through which it is planned to help railway employees to finance the construction of homes. Although the stockholders and officers of the new company are brotherhood members and officers, the brotherhoods are not directly connected with the new organization.

Ben W. Hooper, chairman of the United States Railroad Labor Board, who has been in ill health for some time, will retire upon the expiration of his term on April 15. No action toward the election of his successor as chairman or the appointment of members to replace two other members whose terms expire at the same time as that of Chairman Hooper is expected to be taken pending the action of Congress on railroad labor legislation now pending.

A connecting link between the St. Louis-San Francisco and the Chicago, Rock Island & Pacific from Pacific, Mo., on the Frisco to Villa Ridge on the Rock Island is being considered by the St. Louis-San Francisco as a part of its plan for the joint operation of the two systems. This new eight-mile line will reduce the distance on the Rock Island into St. Louis by approximately nine miles. Nine grade crossings will be eliminated by the abandonment of the line between Villa Ridge and the present junction with the Wabash in St. Louis.

Crates for cook stoves is the subject of Circular No. 20 which has been issued by the Freight Container Bureau, 30 Vesey street, New York City. This circular, profusely illustrated, gives a great mass of information about how to make the best crates and how to use them. The Freight Container Bureau, Edward Dahill, Jr., chief engineer, has now been making studies of this kind for about four years. Its first circular, February 23, 1922, having been devoted to porch rocking chairs. The present circular, like those heretofore issued contains specifications which are put forth tentatively for approval or constructive criticism. Bulletin No. 1, also issued by the Freight Container Bureau this week, is a four-page booklet dealing with tests for tin cans used for carrying liquids and pastes.

The Railroad Labor Board on February 20 sustained the Missouri Pacific and the Texas & Pacific in the dispute with train and engine service employees of the latter road concerning the Missouri Pacific's employment of its own men in operating trains on the joint track between New Orleans, La., and Alexandria. This dispute recently led to the taking of a strike vote by employees of the Texas & Pacific, after which the Labor Board intervened on its own motion. The board's decision sustains the Missouri Pacific in transferring to its employ three train crews formerly employed on the Texas & Pacific, and gives permission for the transfer of two additional crews on a like seniority and employment rights basis and of as many others as may be required in the operation of trains over this portion of the Texas & Pacific. The decision was rejected for the Texas & Pacific train and enginemen by a meeting of general committeemen at Dallas, Tex., on February 20. Conferences, independent of the Labor Board hearings, between officers of the railways and of the organizations are continuing.

Pittsburgh Club to Discuss Train Operation by Signal Indication

At the next meeting of the Railway Club of Pittsburgh, to be held on March 25, Henry M. Sperry, consulting signal engineer of New York, will present an illustrated address on Train Operation by Signal Indication.

New York Railroad Club to Have Purchases and Stores Meeting

At the next meeting of the New York Railroad Club to be held at the Engineering Societies' Building, 29 West Thirty-ninth street, on March 19, C. D. Young, stores manager of the Pennsylvania, will present a paper on "Purchases and Stores Stabilization by Budget." A musical program will be offered by Kidd's Hawaiian Orchestra of the Baltimore division of the Pennsylvania.

Fuel Economy in 1925

Class I railroads operated their freight trains in 1925 with greater efficiency in the use of fuel than ever before, according to a compilation of reports filed by the carriers with the Interstate Commerce Commission, made by the Bureau of Railway Economics.

An average of 159 lb. of fuel was used in 1925 per thousand gross ton-miles, the lowest average ever attained since the compilation of these reports began in 1920, and a decrease of 11 lb. under that for 1924 and 24 lb. under 1923. The volume of freight moved by the railroads in 1925 was 6 per cent greater than in 1924 and was practically the same as that for 1923.

The reduction of 11 lb. of coal in 1925 compared with the preceding year was equivalent to a saving of more than one shovel of coal for every mile run by the average freight train.

C. P. R. Has Good Month in January

Net earnings of the Canadian Pacific for January of this year showed an increase over the same month in 1925 but also were the largest in nine years, net earnings for January of this year being \$1,801,858, an increase over the same month in 1925 of \$1,218,089.

Following are the month's figures with comparison:

	1926	1925	Inc.
Gross	\$13,470,131	\$11,896,513	\$1,573,617
Oper. exp.	11,668,272	11,312,744	355,527
Net	\$1,801,858	\$583,768	\$1,218,089

New Cars and Locomotives

The number of freight cars installed in service in the month of January was 4,907, as shown by reports of the Class I railroads filed with the car service division of the American Railway Association. The total in January, 1925, was 12,735 and in January, 1924, it was 16,192. The present total of 4,907 includes 1,345 box cars, 2,747 coal cars and 325 refrigerators. Freight cars on order on February 1 totaled 50,636, including 24,858 box, 21,298 coal and 1,808 refrigerator cars. On February 1 last year freight cars on order totaled 59,295 and the year before that 25,390.

Locomotives placed in service during the month of January this year totaled 191 compared with 167 in January, 1925, and 271 in January, 1924. Locomotives on order this year, 493, compared with 280 last year and 439 on the same date two years ago.

These figures include new, rebuilt and leased equipment.

Wage Statistics for December

The total number of employees reported by Class I railroads for the month of December, 1925, was 1,753,208, a decrease of 35,681 or 2.0 per cent as compared with the returns for the previous month, according to the Interstate Commerce Commission's monthly bulletin. The decrease in employment is largely attributable to seasonal reduction in the maintenance of way forces. The total compensation, however, shows an increase of \$2,435,026 or 1.0 per cent. This increase in compensation is due principally to the fact that December had two more working days than November. Compared with the returns for the same month last year the total number of persons in December, 1925, shows an increase of 1.0 per cent and the total compensation an increase of 1.8 per cent.

The number of employees at the middle of the month was as follows:

Group	Increase over		
	December, 1925	November, 1925	December, 1924
Executives, officials and staff assistants....	16,660	3	317
Professional, clerical and general.....	283,331	(d) 561	1,912
Maintenance of way and structures.....	362,224	(d) 33,077	20,421
Maintenance of equipment and stores.....	524,652	3,115	(d) 14,228
Transportation (other than train, engine and yard)	209,068	(d) 1,818	1,539
Transportation (yardmasters, switch tenders and hostlers)	24,140	(d) 3	(d) 384
Transportation (train and engine service)...	333,133	(d) 3,340	6,932
Total	1,753,208	(d) 35,681	16,509

(d) Decrease.

M-K-T Lines Fishing Club

The Missouri-Kansas-Texas Lines Fishing Club has been organized by employees of the M.-K.-T. to cultivate and foster good fellowship among the officers and employees of the railroad. Negotiations have been concluded for the lease of the Missouri-Kansas-Texas reservoir at Mokane, Mo., by the club, which will use the lake and grounds for fishing and a recreation resort. The membership is divided into three classes and is restricted to officers and employees of the railroad. Resident members include officers and employees except the chairman of the board, the president, the executive vice-president, the general counsel, the vice-presidents, the general manager, the assistant to the president, the manager of the department of personnel and the manager of the department of public relations who are honorary members. Non-resident members include officers and employees located at off-line points and all points south of Parsons, Kan. Honorary members are entitled to all privileges enjoyed by resident and non-resident members except those of voting and holding office.

Dues for resident members include a \$5 application as membership fee and club dues of \$5 per annum. The non-resident membership fee is \$2, while the annual dues are \$2. Honorary members are not subject to membership fees or dues.

Officers of the club are, president, E. E. Cornish, master mechanic at Franklin, Mo.; treasurer, A. M. Jacobs, cashier at St. Louis, Mo.; and secretary, E. C. Willis, chief clerk to the master mechanic at Franklin.

C. N. R. Entry into Three Rivers, P. Q., Contemplated

Entry into the city of Three Rivers, midway between Quebec City and Montreal, on the north shore of the St. Lawrence river, by the Canadian National is provided in a measure before the Railway Committee of the Quebec Legislature.

The incorporators are Senator J. A. Tessier, Edmond M. Bourassa, Harold L. Clifford, Francois Lajoie, all of Three Rivers, and Rene Boisvert, of Quebec.

The capital of the company is placed at \$500,000, divided into 5,000 shares of \$100 each. The directors are authorized to borrow in Canada or elsewhere by means of bonds, debentures or other securities, payable either in dollars or in sterling, at rates of interest decided upon by the directors.

The company is given power to buy, construct and operate ferries and ships for the transportation of freight and passengers on all navigable waters with which its line may have communication. Power is also given for hydraulic development and all matters connected therewith, as well as the building and operation of telephone and telegraph lines along its lines, its rates to the public to be governed by the Quebec Public Service Commission. It is enacted that the company may merge with any other railway, and the bill also provides for powers to enable it to make arrangements for interchange of traffic, for running rights, for the acquisition of branches, and to buy other railway companies.

The next clause reads: "The company is furthermore authorized to make arrangements with any other company, or corporation or with the Crown, for the purpose of renting, selling or turning over its entire system or all its interest in the road."

Railway Revenues and Expenses for January

Class I railroads in January earned on their property investment at the annual rate of return of 4.60 per cent, according to a compilation by the Bureau of Railway Economics, of reports from 188 Class I roads, representing a total mileage of 236,939 miles. The net railway operating income for the month was \$65,724,560, as compared with \$66,060,177 in January last year. Operating revenues in January amounted to \$480,997,458, compared with \$485,018,679 in January, 1925. Operating expenses totaled \$378,648,714, as compared with \$383,961,979 for the same month one year ago.

Maintenance expenditures in January this year totaled \$164,225,955, a decrease of \$1,200,000 below those for the same month in 1925. Expenditures for maintenance of equipment totaled \$105,442,865, a decrease of \$3,015,000. Maintenance of way expenditures amounted to \$58,783,090, an increase of \$1,815,600 or 3.2 per cent compared with the same month last year.

Thirty-five Class I railroads operated at a loss in January, of which 18 were in the Eastern district, one in the Southern and 16 in the Western district.

In the Eastern district net railway operating income in January totaled \$30,194,166, which was at the annual rate of return of 4.80 per cent. Total gross operating revenues amounted to \$235,898,973 and operating expenses \$190,115,495.

The Southern district shows a net railway operating income of \$12,869,050; annual rate of 6.01 per cent. This was an increase of \$1,417,428 over January last year. Gross totaled \$74,148,973, an increase of 9.2 per cent; operating expenses \$54,941,685, an increase of 6 per cent.

In the Western district January showed a net railway operating income of \$22,661,344, which was at the annual rate of return of 3.88 per cent. Gross revenues amounted to \$170,947,512, a decrease of 3.6 per cent, while operating expenses totaled \$133,591,534, a decrease of 3.5 per cent.

Bureau of Explosives

Colonel B. W. Dunn, chief inspector of the railroads' bureau for the safe transportation of explosives and other dangerous articles, has issued his 18th annual report, which is for the year ending December 31, last. Under the head of explosives proper,

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JANUARY OF CALENDAR YEAR 1926

Name of road	Average mileage operated during period	Operating revenues			Operating expenses			Operating ratio	Net from railway operation	Operating income (or loss)	Net after rents	Net after rents, 1925
		Freight	Passenger	Total (inc. misc.)	Way and structures	Maintenance of Equip-ment	Traffic					
Akron, Canton & Youngstown.....	171	\$232,354	\$454	\$232,808	\$44,648	\$26,584	\$12,293	72.0	\$176,639	\$51,741	\$17,866	\$32,894
Alabama & Vicksburg.....	141	197,574	58,590	256,164	275,380	48,580	12,035	78.9	217,312	38,568	32,513	48,991
Albany, Schenectady & Saratoga.....	188	59,981	367,506	427,487	60,855	93,734	13,324	81.1	396,632	45,157	29,685	684
Ann Arbor.....	293	433,916	28,444	462,360	25,896	93,267	10,574	72.8	347,198	106,612	92,067	38,860
Atchafalaya, Topeka & Santa Fe.....	9,219	9,929,485	3,401,590	13,331,075	1,577,827	3,113,413	351,296	72.6	10,504,914	2,707,559	2,771,510	2,885,279
Baltimore & Annapolis.....	1,908	1,765,969	267,954	2,033,923	386,914	457,511	62,030	80.2	1,734,509	334,428	232,873	502,198
Baltimore & Washington.....	923	769,908	135,482	905,390	62,872	175,207	10,054	55.2	838,518	375,079	326,916	329,011
Atlantic Coast Line.....	93	144,539	75,474	220,013	40,466	41,000	10,482	79.7	200,195	36,636	18,915	15,158
Atlantic Coast Line.....	133	162,558	71,716	234,274	34,641	52,574	11,332	78.1	201,381	42,175	29,838	41,444
Atlantic Coast Line.....	639	378,543	48,212	426,755	94,418	89,061	26,301	88.6	419,679	54,109	11,355	5,225
Atlantic Coast Line.....	4,924	5,603,796	2,679,360	8,283,156	975,897	1,452,714	160,361	65.4	3,111,493	2,567,592	2,178,637	1,584,503
Charleston & Western Carolina.....	342	309,446	24,563	334,009	67,485	42,621	6,720	76.5	266,664	59,797	58,691	22,231
Baltimore & Ohio.....	5,294	16,183,723	2,245,396	18,429,119	2,300,506	4,406,780	385,478	77.9	15,197,022	3,403,650	3,081,625	2,008,077
Baltimore & Ohio.....	80	101,687	105,445	207,132	275,295	23,290	1,863	88.1	242,469	11,356	74,805	76,271
Baltimore & Ohio.....	23	101,687	105,445	207,132	275,295	23,290	1,863	88.1	242,469	11,356	74,805	76,271
Baltimore & Ohio.....	615	557,866	74,245	632,111	653,354	111,933	4,675	68.3	446,501	156,053	182,836	139,213
Belt Ry. Co. of Chicago.....	32	601,277	17,645	618,922	36,962	61,495	3,287	71.7	410,884	119,841	161,819	129,917
Bessemer & Lake Erie.....	228	39,786	17,645	57,431	59,984	335,005	14,770	111.0	707,896	100,040	25,475	158,116
Bingham & Garfield.....	33	39,786	17,645	57,431	59,984	335,005	14,770	111.0	707,896	100,040	25,475	158,116
Boston & Maine.....	2,276	3,585,101	1,646,522	5,231,623	629,210	1,277,804	68,547	82.9	1,022,338	753,918	545,750	399,079
Brooklyn Eastern District Terminal.....	9	107,527	3,054	110,581	6,641	10,011	636	58.3	67,475	42,054	43,174	37,006
Buffalo & Susquehanna R. R. Corp.....	253	88,946	3,054	91,999	25,818	35,095	2,077	109.0	104,550	11,825	758	46,436
Buffalo, Rochester & Pittsburgh.....	601	1,295,737	114,110	1,409,847	13,592	43,980	27,596	81.5	1,189,243	219,943	274,952	187,156
Canadian Pacific Lines in Maine.....	233	256,771	32,137	288,908	20,210	54,034	5,548	76.4	230,610	60,812	45,305	56,503
Central of Georgia.....	1,917	1,624,291	632,003	2,256,294	377,911	434,022	66,722	78.9	1,961,221	212,213	359,862	219,396
Central of New Jersey.....	690	2,590,589	693,102	3,283,691	383,412	1,032,772	14,370	93.4	2,339,966	209,787	580,031	580,031
Central Vermont.....	434	453,635	108,900	562,535	69,399	106,365	19,130	86.1	320,317	67,464	51,334	33,056
Chesapeake & Ohio.....	2,631	9,079,437	759,376	9,838,813	1,339,887	2,975,980	109,133	73.5	2,705,831	2,146,545	2,299,180	1,923,979
Chicago & Alton.....	1,055	1,743,645	539,828	2,283,473	221,948	633,023	73,154	81.2	1,580,377	469,925	361,903	362,173
Chicago & Eastern Illinois.....	945	1,813,111	419,075	2,232,186	177,516	713,154	76,833	83.9	1,515,847	276,126	182,678	257,514
Chicago & North Western.....	8,469	7,576,450	2,250,430	9,826,880	1,115,401	1,047,012	158,429	80.5	8,711,479	1,365,592	1,195,531	982,549
Chicago, Burlington & Quincy.....	9,404	9,326,499	2,065,762	11,392,261	1,029,409	2,975,980	217,396	75.6	3,056,421	2,095,446	1,902,578	1,819,564
Chicago, Great Western.....	1,496	1,453,522	299,059	1,752,581	183,511	407,237	74,135	83.3	1,580,377	229,642	111,444	137,747
Chicago, Indianapolis & Western.....	647	1,104,861	212,788	1,317,649	120,014	334,850	33,337	76.2	1,109,151	345,717	167,308	160,586
Chicago, Milwaukee & St. Paul.....	11,205	9,299,533	1,665,910	10,965,443	1,303,219	3,307,940	245,574	84.7	10,662,345	1,110,111	781,293	1,376,070
Chicago, Peoria & St. Louis.....	215	68,906	83,337	152,243	11,560	18,924	974	94.2	78,523	2,064	18,570	20,877
Chicago River & Indiana.....	19	559,518	51,649	611,167	67,446	67,446	854	65.4	365,931	193,587	151,182	275,584
Chicago, Rock Island & Pacific.....	7,563	6,966,679	2,023,822	8,990,501	1,250,159	2,299,434	237,150	83.6	8,211,008	1,016,717	709,425	1,154,187
Chicago, Rock Island & Gulf.....	458	390,983	84,659	475,642	59,173	69,764	18,188	78.6	403,075	109,645	91,488	117,277
Chic., St. Paul, Minn. & Omaha.....	1,841	1,542,946	427,710	1,970,656	245,815	408,493	101,198	84.7	1,796,860	324,665	133,918	314,314
Cincinnati, Indianapolis & Western.....	347	349,361	25,512	374,873	35,661	80,568	15,868	79.7	320,038	61,451	36,065	41,805
Cincinnati, Indianapolis & Western.....	309	669,296	28,455	697,751	67,774	199,303	22,318	64.5	459,187	217,611	327,213	304,294
Colorado & Southern.....	1,056	825,317	122,707	948,024	94,114	256,084	42,802	79.8	805,910	208,968	145,371	189,358
Ft. Worth & Denver City.....	491	710,139	186,765	896,904	959,048	176,457	15,909	65.2	634,188	275,400	267,554	339,665
Wichita Valley.....	271	133,210	21,875	155,085	17,115	10,277	39	45.7	74,462	88,443	79,040	53,445
Columbus & Greenville.....	167	115,008	32,600	147,608	42,087	19,309	2,634	87.2	156,286	15,991	18,478	5,345
Delaware & Hudson.....	881	1,663,391	281,964	1,945,355	448,257	828,853	49,244	120.5	2,572,274	525,968	601,302	295,026
Delaware, Lackawanna & Western.....	992	3,385,067	1,062,181	4,447,248	502,273	1,265,760	117,773	89.9	4,665,579	528,263	113,324	839,318
Denver & Rio Grande Western.....	2,548	2,205,147	317,492	2,522,639	411,881	502,652	55,824	71.3	1,918,717	585,338	601,100	309,782
Denver & Salt Lake.....	255	326,315	26,038	352,353	66,394	104,263	1,313	73.2	275,618	94,658	91,989	53,246
Detroit & Mackinac.....	375	76,957	25,819	102,776	114,196	40,165	1,980	103.3	117,977	13,994	5,356	6,625
Detroit & Toledo.....	50	419,602	.....	419,602	422,120	36,763	3,155	45.4	236,306	206,822	107,889	47,701
Detroit Terminal.....	26	1,088,168	6,663	1,094,831	37,106	14,870	4	90.4	1,059,814	6,637	3,732	23,367
Detroit, Toledo & Ironton.....	488	1,088,168	6,663	1,094,831	37,106	14,870	4	90.4	1,059,814	6,637	3,732	23,367
Duluth & Iron Range.....	275	89,146	104,379	193,525	51,648	103,632	1,173	61.0	431,977	358,760	266,533	334,593
Duluth, Missabe & Northern.....	306	104,379	6,237	110,616	109,555	160,279	3,074	256.5	272,002	119,628	116,183	178,910
Duluth, Winnipeg & Pacific.....	178	178,145	12,558	190,703	18,602	54,002	4,296	330.5	434,808	251,935	261,544	421,765
Elgin, Joliet & Eastern.....	459	1,847,685	955,919	2,803,604	147,241	603,145	14,039	82.5	1,610,877	24,355	29,271	41,664
Eric Railroad.....	2,053	5,471,324	60,172	5,531,496	804,889	2,160,358	15,962	76.4	3,430,807	128,761	43,177	168,887
Chicago & Erie.....	269	804,130	60,172	864,302	127,337	127,337	25,465	75.1	738,967	125,335	169,143	33,662

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JANUARY OF CALENDAR YEAR 1926—CONTINUED

Name of road	Average mileage operated during period	Operating revenues			Operating expenses			Total	Operating ratio	Net from railway operation	Operating income (or loss)	Net after rents	Net after taxes
		Freight	Passenger	Total (inc. misc.)	Way and structures	Traffic	Maintenance of equipment						
New Jersey & New York.....	45	\$19,183	\$93,223	\$116,220	\$13,368	\$25,394	\$25,394	\$4,038	\$114,892	98.6	\$1,628	\$31,558	\$35,708
N. Y. Susquehanna & Western.....	135	213,399	50,159	302,481	44,997	51,699	51,699	11,276	290,360	96.0	12,121	23,892	20,863
Evansville, Indianapolis & Terre Haute.....	146	200,878	213,755	414,633	36,336	74,558	74,558	4,190	388,942	65.0	69,221	35,988	43,791
Florida East Coast.....	849	1,775,332	1,173,075	3,226,850	434,318	31,335	427,739	56,614	2,258,655	67.9	1,068,195	937,564	503,197
Fort Smith & Western.....	249	122,820	18,549	151,656	26,312	29,549	29,549	7,867	118,602	78.2	53,054	27,544	28,205
Galveston Wharf Co.....	13	362,590	91,383	488,172	42,638	3,208	3,208	3,426	86,094	78.6	3,371	6,371	76,437
Georgia & Florida.....	406	121,930	26,417	159,145	23,225	17,189	17,189	21,595	40,450	82.8	83,722	74,536	44,562
Grand Trunk Western.....	347	1,223,557	169,454	1,778,095	92,517	37,773	554,988	61,814	1,135,860	76.8	342,235	273,586	157,636
Atlantic & Saint Lawrence.....	166	212,869	28,430	255,274	23,026	34,885	129,443	8,824	202,926	79.5	52,348	38,698	39,404
Chic., Det. & Canada Gr. Tr. Jct.....	159	272,528	3,546	323,501	36,165	10,848	10,848	4,330	158,853	49.1	190,468	184,844	105,156
Det., Grand Haven & Milwaukee.....	81	459,418	32,376	542,198	42,483	11,788	246,229	14,884	351,730	64.9	151,730	183,997	14,296
Great Northern.....	8,221	5,220,033	1,065,336	6,994,782	611,902	204,361	2,927,668	229,283	5,463,192	78.1	1,531,590	808,253	808,016
Green Bay & Western.....	234	123,564	8,209	135,885	18,214	20,773	52,476	7,435	98,348	72.4	37,537	29,037	24,957
Gulf & Ship Island.....	307	275,889	52,570	359,681	120,551	66,788	143,044	7,435	345,927	96.2	13,754	11,898	69,607
Gulf, Mobile & Northern.....	466	447,625	39,126	510,509	78,465	81,941	144,421	24,692	351,161	68.7	159,348	118,367	80,176
Hocking Valley.....	348	1,258,981	70,492	1,405,913	156,924	402,923	500,980	39,789	1,115,101	79.3	290,812	179,104	272,894
Illinois Central.....	4,874	10,072,234	2,417,298	13,881,795	1,609,140	2,907,277	4,908,102	333,504	10,070,065	75.3	3,311,730	2,388,208	2,083,396
Yazoo & Mississippi Valley.....	1,379	1,579,950	320,407	2,012,378	346,028	379,949	3,679,356	53,656	1,372,417	78.1	439,961	300,160	410,503
Illinois Central Combined Report.....	6,254	11,652,184	2,737,705	15,954,173	1,955,158	3,287,226	5,677,458	387,160	11,642,482	75.6	3,751,691	2,688,568	2,493,899
Kansas City, Mexico & Orient.....	272	117,280	6,653	132,026	38,805	35,480	56,148	6,148	142,522	107.9	10,496	14,496	34,259
Kansas City Southern.....	465	241,023	17,963	269,866	49,582	63,225	83,779	7,132	209,606	77.7	60,238	53,258	29,175
Kansas City Southern.....	784	1,291,167	130,458	1,662,208	151,184	256,554	509,886	75,735	1,041,622	66.7	520,586	413,171	370,868
Texas & Ft. Smith.....	81	208,396	11,181	234,549	18,274	24,927	65,959	9,058	127,610	53.1	169,939	94,551	47,505
Kansas, Oklahoma & Gulf.....	314	206,295	7,309	219,025	72,459	20,134	79,325	7,876	197,233	90.0	21,802	15,686	835
Lake Superior & Ishpeming.....	160	68,213	4,761	74,661	26,001	27,372	36,325	5,142	96,154	125.4	19,032	31,004	15,432
Lake Terminal.....	13	164,102	2,804	179,225	10,158	11,337	54,956	1,773	84,024	113.0	9,658	1,623	36,080
Lehigh & Hudson River.....	96	164,102	2,804	179,225	10,158	11,337	54,956	1,773	84,024	113.0	9,658	1,623	36,080
Lehigh & New England.....	219	188,175	1,262	195,995	29,609	75,564	113,034	18,111	242,237	123.6	46,262	53,720	39,926
Lehigh Valley.....	1,363	3,237,136	597,154	4,089,191	674,232	1,162,156	2,343,887	135,330	4,467,195	106.2	259,004	375,029	369,167
Louisiana & Arkansas.....	302	310,019	22,155	338,996	55,486	57,390	103,065	10,636	288,509	70.4	100,487	63,415	37,671
Louisiana Ry. & Navigation Co.....	337	265,344	19,188	301,652	62,351	55,126	144,429	10,551	281,142	93.2	20,510	1,612	49,332
Louisiana Ry. & Nav. Co. of Tex.....	206	96,210	8,071	109,185	21,198	12,337	57,413	5,811	100,155	91.7	9,030	5,161	5,620
Louisville & Nashville.....	5,038	9,573,036	2,123,363	12,344,038	1,569,936	2,780,885	4,327,671	270,314	9,592,327	77.1	2,821,691	2,226,463	1,900,925
Louisville, Henderson & St. Louis.....	199	234,368	54,751	299,919	60,285	67,009	12,210	10,115	276,065	61.8	140,032	114,759	83,598
Maine Central.....	1,122	1,239,394	292,995	1,666,087	220,581	336,997	1,342	714,974	1,337,435	80.3	338,917	220,496	198,863
Midland Valley.....	364	269,772	36,350	321,657	35,017	6,906	93,148	16,844	176,038	54.7	145,619	128,744	122,559
Minneapolis & St. Louis.....	1,627	960,050	103,351	1,129,643	268,054	35,990	571,629	43,532	1,012,538	89.6	117,105	50,292	19,046
Minneapolis, St. Paul & S. S. Marie.....	4,400	2,492,496	549,919	3,033,373	444,820	735,551	1,502,608	112,660	2,881,372	87.2	422,001	174,482	91,996
Duluth, South Shore & Atlantic.....	590	297,114	93,534	422,035	36,771	75,978	192,694	12,202	329,358	78.0	92,677	63,677	30,432
Stokane International.....	165	74,568	12,403	93,681	9,388	8,138	33,530	6,157	61,571	65.7	32,110	26,738	14,787
Mississippi Central.....	161	118,853	11,982	135,634	17,511	26,232	35,631	7,521	91,938	69.3	41,696	31,789	34,542
Missouri & North Arkansas.....	364	95,804	17,627	122,373	37,170	21,523	52,041	7,584	124,824	102.0	2,451	4,889	1,412
Missouri-Kansas-Texas.....	1,799	2,110,007	427,887	2,766,030	253,023	680,728	775,249	88,869	1,873,943	67.7	892,087	688,806	869,706
Mo., Kansas, Texas of Texas.....	1,389	1,236,105	361,369	1,771,936	231,835	213,880	449,408	61,962	1,314,500	75.3	437,436	383,274	167,330
Missouri Pacific.....	7,337	8,453,853	1,423,796	10,684,098	1,371,266	2,197,286	4,126,969	314,228	8,290,434	77.6	2,393,604	1,919,520	1,508,693
Gulf Coast Lines.....	322	832,370	197,704	1,118,194	251,455	203,160	350,312	55,618	806,545	80.18	221,579	158,363	131,011
International-Great Northern.....	1,159	1,045,200	206,246	1,289,334	243,760	240,459	601,526	60,460	1,161,035	83.57	228,299	186,906	133,776
Texas & Pacific.....	1,953	2,246,247	514,492	2,994,810	453,240	554,858	1,119,699	96,622	2,292,760	76.6	702,050	547,531	282,952
Mobile & Ohio.....	1,161	1,374,043	134,295	1,594,311	210,891	46,074	572,669	44,995	1,180,146	74.0	414,165	318,013	288,348
Monongahela.....	130	611,047	63,377	674,424	65,000	961	197,211	11,217	336,571	52.3	306,806	278,228	181,855
Monongahela Connecting.....	17	.....	.....	.....	.....	375	110,563	3,070	171,983	72.5	65,137	59,624	20,848
Montgomery & Chicago.....	57	49,077	299	49,959	13,877	30,683	15,210	6,915	68,015	136.1	18,056	19,973	41,041
Nashville, Chattanooga & St. Louis.....	1,259	1,365,857	442,203	1,967,118	262,146	405,570	758,212	74,311	1,592,633	81.0	374,485	299,360	287,006
Nevada, North & South Shore.....	165	64,004	8,124	78,921	14,854	6,829	16,231	5,439	44,356	56.2	34,565	23,581	19,431
Newburgh & South Shore.....	7	.....	.....	.....	.....	.....	78,936	4,031	130,165	85.8	21,633	9,600	24,609
New Orleans Great Northern.....	274	239,951	24,854	271,407	30,932	48,871	75,310	11,411	172,455	63.5	98,952	79,202	60,266
New York Central.....	6,889	18,316,940	8,283,924	30,356,907	3,482,970	3,482,970	6,965,940	1,120,163	24,042,285	79.2	6,314,712	4,279,380	4,272,811
Indianapolis Northern.....	244	342,472	37,764	420,236	38,853	59,214	141,817	13,608	235,614	68.0	120,102	97,434	60,491
Cleveland, Cin., Chic. & St. Louis.....	2,391	5,445,866	1,408,935	7,423,899	693,950	1,643,510	2,972,235	289,369	5,797,169	78.1	1,626,730	1,211,094	1,142,689
Indiana Harbor Belt.....	116	4,606,196	1,877,032	6,483,228	87,006	5,410	433,935	35,123	694,512	78.4	2,092,996	1,628,888	1,576,326
Michigan Central.....	1,871	2,416,158	251,982	2,952,509	376,345	770,125	1,465,536	77,869	2,184,389	79.4	1,976,521	1,576,326	1,576,326
Pittsburgh & Lake Erie.....	231	4,239,359	133,517	4,515,456	528,771	881,005	1,670,311	165,585	3,317,635	73.5	1,197,801	946,004	880,728
New York, Chicago & St. Louis.....	1,695	4,239,359	133,517	4,515,456	528,771	881,005	1,670,311	165,585	3,317,635	73.5	1,197,801	946,004	880,728

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REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JANUARY OF CALENDAR YEAR 1926—CONTINUED

Name of road	Average mileage operated during period	Operating revenues			Operating expenses			Total	Operating ratio	Net from railway operation	Operating income (or loss)	Net after rens.	Net after rens. 1925.
		Freight	Passenger	Total (inc. misc.)	Maintenance of way and structures	Equipment	Traffic						
N. Y., New Haven & Hartford	1,918	\$4,782,679	\$4,069,080	\$10,019,492	\$1,126,635	\$2,295,526	\$72,545	\$3,993,238	78.4	\$2,161,137	\$1,693,333	\$1,297,201	\$1,412,078
Central New England	276	404,052	85,822	489,874	78,347	189,214	6,880	376,355	83.1	50,705	23,431	1,669	71,517
New York Connecting	26	203,268	227,395	430,663	15,134	8,522	51,751	76,852	33.8	150,543	112,543	110,864	115,307
New York, Ontario & Western	569	247,042	86,469	333,511	89,804	144,314	15,535	342,399	130.2	145,388	195,487	224,805	86,621
Norfolk & Western	2,241	8,010,436	647,663	8,658,099	1,236,296	1,720,247	110,709	2,957,221	64.5	3,183,205	2,432,226	2,703,952	2,194,166
Norfolk Southern	931	551,706	78,336	630,042	92,933	167,014	22,526	282,246	78.7	143,006	91,012	68,537	48,088
Norfolk Western	6,882	5,135,316	943,842	6,079,158	710,980	1,446,358	191,119	2,701,981	80.4	1,305,433	638,558	1,011,734	760,086
Northwestern Pacific	477	267,691	126,588	394,279	95,886	75,884	5,678	205,260	92.1	34,312	6,721	13,482	21,011
Pennsylvania R. R.	10,500	37,274,373	12,310,053	49,584,426	7,440,964	13,155,268	671,565	21,768,624	83.4	9,029,426	7,032,827	5,921,334	5,042,780
Baltimore, Chesapeake & Atlantic	130	43,174	14,735	57,909	7,985	14,735	3,228	104,098	164.5	40,814	40,814	42,980	45,968
Long Island	397	643,854	1,682,412	2,326,266	504,603	2,326,266	66,296	2,392,562	89.6	261,090	202,773	169,546	82,251
West Jersey & Seashore	378	328,845	409,152	737,997	148,126	148,126	12,645	823,606	104.8	38,041	38,116	64,542	61,199
Peoria & Pekin Union	19	24,351	3,083	27,434	10,370	12,389	837	72,060	63.9	58,808	42,808	65,209	60,343
Pere Marquette	2,262	2,649,840	335,740	3,017,580	240,672	747,164	58,748	1,278,498	75.7	780,536	590,590	447,547	549,708
Pittsburgh & Shawmut	102	118,198	5,005	123,203	10,421	39,628	1,376	97,733	78.0	27,627	27,507	43,222	23,110
Pittsburgh & West Virginia	92	390,305	6,243	400,548	30,537	81,058	7,680	241,566	56.1	189,405	140,392	223,131	164,470
Pittsburgh, Shawmut & Northern	210	133,198	3,337	136,535	22,050	40,288	2,394	53,468	89.0	15,376	12,414	10,781	26,321
Quincy, Omaha & Kansas City	250	48,208	21,122	69,330	13,420	15,062	1,074	24,276	97.6	2,264	3,182	6,226	17,393
Reading, Omaha & Kansas City	1,136	5,462,335	797,974	6,260,309	857,311	1,678,028	65,947	2,744,765	83.9	1,087,265	686,366	944,490	1,485,082
Atlantic City	161	102,734	120,657	223,391	101,402	28,557	3,888	180,013	134.6	82,072	107,322	133,624	187,169
Perkmen	41	119,536	4,363	123,900	5,599	7,509	106	44,125	44.5	55,580	55,580	59,221	44,083
Port Reading	19	165,611	1,121	166,732	14,346	8,590	229	75,425	47.9	110,043	93,291	41,329	41,103
Richmond, Fredericksburg & Potomac	117	425,891	501,925	927,816	76,938	171,225	7,823	365,430	62.4	422,072	343,112	298,949	259,888
Rutland	413	272,601	107,473	380,074	85,867	107,896	9,090	222,273	89.8	49,711	27,049	40,770	7,658
St. Louis-San Francisco	4,986	5,304,827	1,412,041	6,716,868	819,744	1,311,774	103,689	2,582,613	69.8	2,176,413	1,803,540	1,686,700	1,756,819
St. North & Rio Grande	237	165,677	12,718	178,395	21,556	21,556	3,247	106,479	94.1	6,659	2,489	7,456	8,190
St. Louis, San Francisco & Texas	137	183,677	12,718	196,395	21,556	21,556	3,247	106,479	94.1	6,659	2,489	7,456	8,190
St. Louis Southwestern	940	1,350,673	142,757	1,493,430	265,556	274,127	61,446	1,098,942	69.8	475,817	400,208	307,342	340,531
St. Louis Western of Texas	807	528,650	68,254	596,904	155,815	130,049	27,153	263,229	94.1	38,247	10,427	57,836	52,054
San Antonio, Val Verde & Gulf	318	103,749	19,434	123,183	17,218	15,269	3,409	33,952	72.0	37,581	33,803	18,392	7,311
Seaboard Air Line	3,928	3,769,649	1,733,006	5,502,655	603,016	789,323	211,696	2,321,294	75.5	1,484,764	1,194,239	834,943	544,135
Southern Railway	6,790	8,327,665	2,864,700	11,192,365	1,779,873	2,238,081	241,606	4,491,822	75.3	3,002,472	2,141,611	1,902,758	2,080,146
Alabama, Great Southern	318	614,710	169,590	784,300	126,166	135,461	22,325	262,916	71.1	242,195	181,042	202,685	142,412
Cinn., New Orleans & Tex. Pac.	338	1,353,471	455,868	1,809,339	248,373	353,709	44,050	574,192	66.3	647,538	534,636	505,915	537,079
Georgia Southern & Florida	207	433,213	225,500	658,713	80,740	88,761	18,485	281,169	69.2	216,294	179,631	114,553	103,747
New Orleans & Northeastern	401	395,149	80,279	475,428	71,251	78,874	12,335	159,710	66.9	168,381	111,961	77,719	70,920
Northern Alabama	110	110,826	10,126	120,952	30,709	7,100	2,684	41,727	68.8	38,511	33,175	2,368	12,293
Southern Pacific	8,765	10,702,563	3,431,151	14,133,714	2,886,195	2,878,493	325,353	5,565,164	77.3	3,486,338	2,266,663	2,131,025	1,635,436
Atlantic Seaboard Lines	2,104	1,734,855	487,082	2,221,937	408,943	488,646	57,187	892,903	82.3	426,032	326,855	211,066	111,495
Houston & Texas Central	891	825,452	227,214	1,052,666	172,414	268,054	30,116	412,409	81.6	210,125	136,936	96,239	452,423
Houston, East & West Texas	191	198,911	36,439	235,350	42,101	37,453	4,141	75,253	75.4	61,069	47,331	32,072	4,023
Louisiana Western	207	223,218	86,427	309,645	44,148	56,934	16,301	106,473	74.1	86,743	56,110	44,619	31,799
Morgan's L. & T. R. R. & S. Co.	400	533,806	139,414	673,220	118,241	172,171	23,408	322,670	91.6	62,697	11,781	17,154	45,995
Texas & New Orleans	544	653,500	155,712	809,212	170,609	109,932	16,925	345,924	78.5	187,400	152,275	111,947	66,856
Spokane, Portland & Seattle	554	423,244	100,244	523,488	581,781	69,265	9,806	197,122	68.7	181,837	104,794	90,941	57,291
Tennessee Central	296	214,468	34,650	249,118	61,074	42,954	7,501	101,794	85.6	18,841	32,203	10,180	5,849
Terminal Railroad Assn. of St. Louis	55	.....	.....	1,130,977	148,934	96,973	2,693	481,522	66.8	375,977	271,754	354,493	466,248
East St. Louis Connecting	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
St. Louis Merchants' Bridge Term.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
St. Louis Transfer Ry.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Toledo, Peoria & Western	248	89,077	23,325	112,402	18,470	32,771	1,999	69,654	106.5	7,932	14,932	16,215	17,995
Trinity & Brazos Valley	367	168,975	10,534	179,509	70,552	31,214	4,573	102,177	119.4	36,283	43,983	71,047	153,538
Union Pacific	128	17,805	6,448	24,253	13,406	13,415	1,337	36,968	133.5	18,104	23,854	24,300	22,484
Union R. R. of Penna.	45	5,778,394	1,250,641	7,029,035	645,525	1,821,447	139,706	2,403,989	86.1	115,964	94,676	135,605	17,265
Oregon Short Line	2,443	2,262,714	335,559	2,598,273	359,875	561,977	44,960	908,956	73.6	735,344	478,931	428,329	568,184
Oregon, Wash. R. & Nav. Co.	2,237	1,505,848	321,173	1,827,021	391,908	391,908	62,137	835,134	86.1	1,713,814	1,056,922	27,767	54,821
Los Angeles & Salt Lake	1,207	1,372,262	311,079	1,683,341	408,779	432,682	58,202	1,718,894	92.2	144,598	11,757	71,617	201,701
St. Joseph & Grand Island	258	287,413	19,478	306,891	35,508	43,333	2,932	106,977	64.2	114,862	90,346	75,555	52,455
Utah	102	166,985	27,146	194,131	27,146	39,100	345	36,932	66.1	56,594	47,110	42,688	65,243
Virginian	545	1,609,405	61,509	1,670,914	183,581	360,798	12,988	410,548	56.8	760,367	627,713	71,903	712,685
Wabash	524	2,866,441	569,263	3,435,704	569,263	995,748	151,843	2,424,938	76.9	1,251,271	989,238	600,219	591,246
Western Maryland	804	1,755,537	50,492	1,806,029	197,197	439,319	35,800	580,608	70.6	545,272	470,772	448,225	387,417
Western Pacific	1,042	917,149	103,111	1,020,260	135,145	210,232	35,843	412,581	78.2	234,619	153,111	267,250	194,162
Wheeling & Lake Erie	511	1,381,489	39,605	1,421,094	164,348	370,683	33,141	503,397	75.1	374,030	247,197	257,727	199,025

the record for the year shows 26 accidents but no persons killed or injured; property loss, \$11,702.

Including explosives "and other dangerous articles" the total for 1925 is 1,601 accidents in railway transportation, 13 persons killed, 57 injured; total property loss \$1,056,178. Of this total 78 per cent is charged to inflammable liquids, mainly gasoline. Under the head of inflammable liquids the causes are given as: negligence of employees, 23 cases; rough handling, 103 cases; improper loading, etc., 184 cases; derailment or collision, 66 cases; miscellaneous, 322 cases. Ten persons lost their lives and 15 were injured as a result of explosions of gasoline. One-half the deaths and more than one-half of the injuries due to such accidents were the direct consequences of trespassers entering empty tank cars. The 66 train accidents are charged with an aggregate loss, under this head, of \$650,847. The aggregate quantity of explosives transported on the railroads of the country during the year (with no death or personal injury) was over 500 million pounds. This record, says Colonel Dunn, affords positive evidence of excellent team work by thousands of factory and railroad employees. The report contains the usual chapters on the results of the studies, experiments and inspections made by the employees of the bureau during the year. M. L. Oglesby, special representative of the bureau has, during the year delivered 193 addresses, before meetings which had a total attendance of 16,259. Other lectures have been delivered at 433 places to meetings recording an aggregate attendance of 19,762.

Reprints of bulletins which have been issued by the bureau during the year fill an appendix of 30 pages.

Boston & Maine Discusses Field of the Rail Motor Car

The Boston & Maine, which has just placed an order for 10 additional gas-electric motor rail cars, bringing to approximately \$1,000,000 its investment in this character of equipment, has made some pertinent comment on the use of this equipment in the forthcoming annual report for 1925.

The report contains the announcement that three of these new cars, seating 90 persons each and equipped with double-end control, will be used in suburban service at other than rush hours. The report continues:

"While there is a field for the self-propelled passenger car on steam railroads, the scope is by no means universal. The power and capacity of such cars are inadequate to meet the peak requirements of commutation traffic, and in the case of short branch lines with very light traffic, the investment and operating cost are out of all proportion to the revenue. In the former class of traffic, motor rail cars cannot satisfactorily replace steam with the greater capacity of the latter for handling peak loads; in the latter class, the highway bus appears to furnish the economical solution.

"There is an intermediate field, however, where the passenger traffic does not warrant steam service, and in some instances the introduction of a less expensive substitute may permit of greater frequency of service and result in the retention of traffic which otherwise would be diverted to public or private transportation on the highway."

Most of the new cars, like most of the 13 which are now in operation, are intended to supply such an improved and economical service for branch lines. Discussing further the use of this equipment, the Boston & Maine's report says:

"While the development of gasoline motor cars for passenger transportation on the rails cannot be said to have passed beyond the experimental stage, the economies as compared with steam service have appeared to be sufficient to justify a substantial investment in this type of equipment.

"The Boston & Maine now has in service 13 gasoline rail passenger cars of which eight are mechanically driven and five are of the gas-electric type. Eleven additional cars are now under order—all of the gas-electric type.

"These cars are being operated on both main lines and branches, the following runs being indicative of the service to which they are believed to be adapted: Boston-Northampton, North Adams-Troy, Nashua-Worcester, Portland-Rochester, Salem-Lowell, Springfield-Greenfield.

"Practically all of these cars are intended to haul an additional car of light construction. Among the cars under order, however, are three with double-end control having a seating capacity of over 90 passengers. These are intended for interurban service at other than rush hours."

Traffic News

A special train of 86 carloads of automobiles left Chicago for Los Angeles, Cal., over the Atchison, Topeka & Santa Fe, on March 1.

The Pere Marquette has established fast freight service for automobile shipments from Flint, Mich., to Chicago. The new train leaves Flint at 6 p. m. daily and arrives in Chicago the next evening.

The second regular meeting of the Pacific Northwest Advisory Board will be held in the Davenport Hotel, Spokane, Wash., on March 26. Carl R. Gray, president of the Union Pacific, and Governor C. C. Moore, of Idaho, will be the principal speakers at a banquet to be held the same evening.

The Chicago, Rock Island & Pacific has established a vacation travel service bureau in New York, in charge of its city passenger agent. The feature of the service is the sale of individual tour tickets on the "go-as-you-please" all expense plan. Effort will be directed to relieving the traveler of care and responsibility, including board and lodging at hotels, or camps and automobile trips.

The thirteenth regular meeting of the Trans-Missouri-Kansas Shippers' Advisory Board will be held in the City Club, St. Louis, Mo., on March 16. Besides the reports of the standing committees there will be a discussion of commodity minimums including the question of a graduated scale of minimums to develop heavier car loading. The question of store door delivery on l. c. l. freight will also be considered. New business will include the subject of preparing cars for cement loading.

The Chicago Shippers' Conference Association at a meeting in Chicago on March 3, adopted a resolution endorsing a proposal for the development by the federal government of a complete system of inland waterways; also the proposed early completion of the Illinois Waterway and the state's plan for the construction of locks standard with the federal locks in the Ohio river; and urged upon the federal government the importance of allowing a proper diversion of water from the Great Lakes to the Mississippi Valley system to permit the development of a nine-foot navigable channel from Chicago to New Orleans.

The Southwest Shippers' Advisory Board will hold its eleventh regular meeting on Friday and Saturday, March 19 and 20, at Brownsville, Tex., the southernmost point within the Board's territory. A special invitation has been extended to railroad men and shippers in the Republic of Mexico, and it is expected that there will be a strong representation from that country. In addition to the regular reports from different territorial committees and representatives, there will be an address by L. M. Betts of the American Railway Association and a report is scheduled from Mr. Byron, representing the freight station section, A. R. A. Reports are expected from representatives of the chambers of commerce of four states: Texas, Oklahoma, Louisiana and Arkansas. A resume of conditions in the southwest territory was issued on March 1, by R. C. Andrews, Dallas, Texas, district manager of the car service division, A. R. A.

The Boston & Maine has announced a number of improvements in passenger train service, effective March 15. There will be a new train from Boston to Manchester, N. H., at 11:30 p. m. and one at 11:20 p. m. for points nearer Boston. From Manchester (56 miles north of Boston) there will be an additional afternoon train (4:30 p. m.), and improved service from Manchester to Boston in the morning is to be afforded by a combination of bus and railroad service. A motor coach making the local stops will leave Manchester at 5:15 a. m.; Nashua, 6:05 a. m., and connect at Lowell (26 miles from Boston) with the train which leaves for Boston at 6:56 and is due in Boston at 8 o'clock. The present timetable shows a train from Manchester for Boston at 5:17 a. m., and another at 5:49 a. m., but both of these are through trains from Montreal. A motor coach will run from Lowell to Manchester in the afternoon, connecting with the train leaving Boston at 5:38 p. m.

C. & A. Authorized to Operate Buses

The Alton Transportation Company, a subsidiary of the Chicago & Alton, was granted permission by the Illinois Commerce Commission on March 4 to operate motor buses paralleling the main line of the Alton between Joliet, Ill., and Springfield, 148 miles.

Imperial Valley Yields Over 14,000 Cars of Lettuce

Shipments of lettuce from the Imperial Valley, Southern California, this year are estimated to amount to 14,350 carloads, the industry having grown from a shipment of 28 cars in 1916. In 1916 less than 100 acres were developed to the cultivation of lettuce while this year the total acreage is 28,700. The shipping of head lettuce from the Imperial Valley begins about December 15 and ends around April 5. The number of cars moved each year since 1916 is as follows: 1916, 28 cars; 1917, 408 cars; 1918, 982 cars; 1919, 1,064 cars; 1920, 3,066 cars; 1921, 3,681 cars; 1922, 4,828 cars; 1923, 7,916 cars; 1924, 9,275 cars; 1925, 10,222 cars, while the estimated total for 1926 is 14,350 cars.

Livestock Prices Increase More Than Freight Rate

The average increase in the price of livestock in 1925, compared with the preceding year, was greater than the total freight and distribution charges combined, according to a study just completed by the Bureau of Railway Economics. Prices increased 21.8 per cent, while the average net proceeds received by the seller at the shipping point was approximately 24 per cent greater in 1925 than in 1924. The increase for cattle and calves was 11.3 per cent, for hogs, 55 per cent, and for sheep, 16.7 per cent. As freight charges and other costs of distribution showed practically no change in the two years, the generally upward trend of prices was clearly due to factors separate and distinct from transportation and distribution costs. Out of every dollar the purchaser paid for livestock in 1925, 93 cents was realized by the producer as compared with 91.4 cents in 1924.

The study was based on the sales of 11,381 carloads of livestock aggregating 794,424 head, for 36 marketing days at intervals of three weeks from October 15, 1923, to October 19, 1925. Data came from 2,966 shipping points in 39 states, and sales were studied at ten large livestock markets, namely, Baltimore, Chicago, East St. Louis, Fort Worth, Jersey City, Kansas City, Lancaster, Nashville, South Omaha and South St. Paul. As the shipments were fewer and consisted of lighter weight stock in 1925 than in 1924, the aggregate amount charged to freight was considerably less in 1925 than it was in 1924.

Boston & Maine Plans More Bus Routes

The Boston & Maine Transportation Company has filed with the Public Service Commission of New Hampshire and with the selectmen of several towns in Massachusetts petitions for authority to operate motor coaches in extension of rail service and also as a supplement to passenger trains.

In one petition to the New Hampshire Commission, authority was asked for the operation of motor coaches from Keene to Wilton, through the towns of Marlboro, Dublin, Peterboro and Temple. This motor coach route would be in prolongation of that from Nashua to Wilton, on which a petition is now pending.

The New Hampshire Commission is asked also to approve the operation of motor coaches from Portsmouth to Rye, North Hampton, Hampton, Hampton Falls and Seabrook to the New Hampshire-Massachusetts line, following the Lafayette road. It is proposed to operate also from North Hampton Four Corners to the North Hampton railroad station using the direct route. The Boston & Maine is now considering the matter of extending this proposed route through to Newburyport as a matter of further convenience.

The petitions to the selectmen of the towns of Westford, Littleton and Groton are made in connection with a proposal to operate from Westford through Graniteville and Forge Village to Littleton Common and to the Littleton railroad station on the Fitchburg division, a motor coach service which will give some of these communities like Littleton Common, which are off the railroad lines, transportation not previously available, and to other places a more frequent and flexible service than is now possible by rail. Returning, motor coaches on this route will operate from the Littleton railroad station through Littleton Common to Westford, and thence to Graniteville and Forge Village.

Commission and Court News

Interstate Commerce Commission

The American Newspaper Publishers' Conference has filed an application with the commission requesting reconsideration of the recent order of the commission denying leave to intervene in the railway mail pay proceedings.

The commission, on the complaint of the Jones & Laughlin Steel Corporation, has ordered the railroads to establish reduced freight rates which it prescribes on manufactured iron and steel articles, in carloads, rated fifth class in the Official Classification, from Pittsburgh, Woodland and Johnstown, Pa., Buffalo, N. Y., Wheeling and Benwood, W. Va., and Steubenville and Youngstown, Ohio, to St. Louis, Mo., and points in Indiana and Illinois; effective on May 29.

The commission has suspended from March 10 until July 8, 1926, the operation of certain freight-rate schedules published by the Chicago, Burlington & Quincy, which propose to restrict transit privileges on grain and grain products at Denver, Colo., so that these privileges would not apply in connection with commodities received from points on other lines and delivered to the Burlington at various junction points in Iowa, Montana and Nebraska, on and west of the Missouri river, when such commodities have had a previous transit at Missouri river cities; and also propose to cancel transit privileges at Denver on all grain and grain products originating at Omaha or South Omaha, Nebr., on the Burlington.

The Interstate Commerce Commission in conference on March 8 considered its recent order reopening for further consideration the so-called Lake Cargo Coal Rates, 1925. By that order all parties were required to show cause within 20 days from March 2 whether or not further hearing should be had to supplement the record already made. The commission now states that any party adverse to further hearing has the right to reply to all applications for further hearing within ten days after having received copies of such applications.

Low Rates on Fertilizer in South Recommended

The Interstate Commerce Commission on March 1 made public a report proposed by Examiner H. W. Archer on the investigation of rates on fertilizer and fertilizer materials between points in the Southern states recommending a finding by the commission that "the peculiar function of this traffic and the independent tonnage resulting from its use entitle it to a relatively low level in the rate scale." The report proposes a scale of rates which the examiner recommends the commission to prescribe as reasonable for application between points in the Southeast, recommends that certain so-called short or weak lines be accorded arbitraries above the distance scale, and findings that undue prejudice exists against interstate shippers and localities, and unjust discrimination against interstate commerce, by reason of intrastate rates in Alabama; that intrastate rates in Georgia and Florida are not unlawful for the future, except in certain individual instances, and that full local rates from Ohio river crossings and Virginia cities are unreasonable for the transportation of cyanamid originating beyond those gateways.

United States Supreme Court

In the suit by the Texas & Pacific to enjoin the Gulf, Colorado & Santa Fé from constructing the Hale-Cement Line, on the ground that it was an extension and not merely a spur track the Supreme Court of the United States, reversing the decree of the Circuit Court of Appeals, Fifth Circuit, 4 F. (2) 904, which reversed that of the federal district court for southern Texas, 298 Fed. 488, holds that the line is not a spur or industrial track, but an extension for which a certificate of public convenience and necessity is required under Transportation Act, 1920, §402, paragraph 18. The proposed line was to run from Hale to the Industrial District near Dallas.—Texas & Pacific v. G., C. & S. F. Decided March 1, 1926. Opinion by Mr. Justice Brandeis.

Foreign Railway News

New Line for Australia

The Parliament of South Australia has passed a bill authorizing the construction of a railroad from Oonadatta, the northern terminus of railways in that state, northward some 300 miles to Alice Springs in the Northern Territory. The new line will be a link in the projected trans-continental north-south line.

A New Line in East Africa

Work is proceeding, according to the Times (London) Trade Supplement, on the branch line connecting the Central Railway of Tanganyika (East Africa) with Lake Victoria. The Tanganyika colony lies to the south of Lake Victoria and Kenya colony to the north. Kenya has its only railway (the Uganda Railway) connecting Lake Victoria with the East Coast. The only outlet which the territory in Tanganyika at the south of the lake has had is via boat across the lake and thence via the Uganda Railway. The new branch line will enable the products of this region to be moved to the coast entirely through Tanganyika.

Miscellaneous

The following reports have been received by the Department of Commerce from its agents in various parts of the world:

The German Reichsbahn Gesellschaft showed a deficit for November for the first time since its foundation. Receipts amounted to 359,707,000 marks and expenditures to 380,039,000 marks, creating an excess expenditure of about 20,000,000 marks.

Spanish railway earnings increased in 1925 to 331,000,000 pesetas, compared with 327,000,000 pesetas the preceding year. The government intends to authorize the purchase of locomotives and rolling stock to the value of 131,000,000 pesetas.

The Austrian Federal railways have invited tenders from domestic locomotive builders for 30 express, 100 passenger and freight, and 50 switching locomotives, valued at \$3,500,000. These are to replace 555 old engines, whose cost of upkeep is estimated at \$800,000 annually.

The Argentine State Railways will purchase 22 locomotives, and competition among British, German, and American manufacturers is expected to be keen. The plans of the Santa Fe type engines made by the Baldwin Locomotive Works are to be used for this tender.

A total of 2,970,000 paper pesos will be spent for equipment for the Argentine State Railways, under authorization of November 28. Expenditures will be for the purchase of 20 locomotives, renewal of bridges, track, and rails, construction of branch lines and sidings, double tracking, cross-overs and switches, etc.

A line authorized to connect the Brazil Central Railway with Port of Santos is expected to alleviate congestion at the port. The Sao Paulo state legislature has also authorized the Sorocabana Railway to extend its lines to the port. Both railways are government-owned, one by the federal government and the other by the state of Sao Paulo.

The Peloponnesus Railway will be extended from Kyparessia to Marathon and from Tripolis to Sparta, work to commence immediately. Other extensions also are contemplated, the total building program to involve the expenditure of 400,000,000 drachmas (\$5,900,000).

A total of 3,000,000 lire for Turkish railway construction has been asked by the Minister of Public Works of that country. The present government railway building program is costing over 1,000,000 lire a month.

A new freight classification on the Brazilian railways has been devised by the Contadoria Central Ferroviaria, an organization somewhat resembling the Interstate Commerce Commission of the United States. The new system became effective February 1, and provides standard rates for all Brazilian railways.

Norton Griffith's contract for the construction of the Tolima-Huila-Caqueta Railway is void as the comptroller of Colombia has set aside no money for the project and no special fund was created in the budget for 1926.

Equipment and Supplies

Locomotives

Southern Railway Orders 113 Locomotives

The Southern Railway has ordered 46 heavy Mikado type locomotives with 27 by 32 in. cylinders and a total weight in working order of 325,000 lb., 5 light Mikado type locomotives with 22 by 28 in. cylinders and a total weight in working order of 210,000 lb., 23 heavy Pacific type locomotives with 27 by 28 in. cylinders and a total weight in working order of 304,000 lb., and 10 consolidation type locomotives with 22 by 30 in. cylinders and a total weight in working order of 250,000 lb., a total of 84 engines, all ordered from the American Locomotive Company. Orders were also placed for 7 Mallet type locomotives with the Baldwin Locomotive Works and for 22 eight-wheel switching locomotives with the Lima Locomotive Works. Inquiry for this equipment was reported in the *Railway Age* of February 27.

THE DELAWARE, LACKAWANNA & WESTERN is inquiring for 15 Mikado type and 10 Mountain type locomotives.

THE GREAT NORTHERN has authorized the expenditure of \$100,000 for Diesel electric locomotives for use in its St. Paul, Minn., yards.

THE LONGVIEW, PORTLAND & NORTHERN has ordered two Mikado type locomotives from the American Locomotive Company. These locomotives will have a total weight in working order of 282,000 lb. and 25 by 30 in. cylinders.

THE TENNESSEE COAL, IRON & RAILROAD COMPANY has ordered one six-wheel switching locomotive from the American Locomotive Company. This locomotive will have a total weight in working order of 169,000 lb. and 22 by 26 in. cylinders.

THE STANDARD SLAG COMPANY, Youngstown, Ohio, has ordered one 0-4-0 tank switching locomotive from the American Locomotive Company. This locomotive will have a total weight in working order of 100,000 lb. and 16 by 24 in. cylinders.

THE CHICAGO, ROCK ISLAND & PACIFIC has ordered 10 Mikado type locomotives, to have a total weight in working order of 340,000 lb. and 28 by 30 in. cylinders, and five Mountain type locomotives, to have a total weight in working order of 370,000 lb. and 28 by 28 in. cylinders, from the American Locomotive Company. Inquiry for this equipment was reported in the *Railway Age* of February 27.

Freight Cars

THE PERE MARQUETTE is inquiring for 10 air dump cars.

THE MISSOURI PACIFIC contemplates buying 600 freight cars.

THE CENTRAL OF NEW JERSEY is inquiring for 1,000 box cars of 50 tons' capacity.

THE NORTHERN PACIFIC has ordered 220 underframes from the Siems-Stembel Company.

THE NORTH AMERICAN CAR COMPANY is inquiring for 500 tank cars of 8,000 gal. capacity.

THE LAKE ERIE ENGINEERING CORPORATION, Buffalo, N. Y., is inquiring for a scale test car.

THE NATIONAL RAILWAYS OF MEXICO are inquiring through the car builders for two scale test cars.

THE OLIVER IRON MINING COMPANY has ordered 40 air dump cars of 30 cu. yd. capacity from the Magor Car Corporation.

THE IMPERIAL REFINING COMPANY, Tulsa, Okla., has ordered 100 tank cars of 8,050 gal. capacity from the Pennsylvania Car Company.

THE LITCHFIELD & MADISON has ordered 200 hopper car bodies from the Ryan Car Company, in addition to the 50 bodies ordered some time ago.

THE CANADIAN NATIONAL is inquiring for 40 tank cars in addition to the 50 freight refrigerator cars reported in the *Railway Age* of March 6.

THE SOUTHERN PACIFIC has ordered 1,100 box cars from the Pullman Car & Manufacturing Corporation and 500 gondola cars from the Pressed Steel Car Company. Inquiry for this equipment was reported in the *Railway Age* of January 30.

THE SOUTHERN RAILWAY has ordered 1,000 box cars from the Mt. Vernon Car Manufacturing Co., 1,000 hopper cars from the Tennessee Coal, Iron & Railroad Co., and 250 ballast cars from the General American Car Company. Inquiry for this equipment was reported in the *Railway Age* of February 20.

Passenger Cars

THE CANADIAN NATIONAL is inquiring for 50 express refrigerator cars.

THE CENTRAL OF GEORGIA is inquiring for 5 open coaches and 1 partition coach.

THE SOUTHERN PACIFIC has ordered 10 coaches and 28 baggage cars from the Pullman Car & Manufacturing Corporation and 6 combination baggage and postal cars from the Standard Steel Car Company. Inquiry for this equipment was reported in the *Railway Age* of February 20.

Motor Vehicles

THE BOSTON & MAINE contemplates buying about 25 motor coaches, some of which will be the de Luxe type and some of the pay-enter city type.

THE NEW ENGLAND TRANSPORTATION COMPANY, the New York, New Haven & Hartford's bus operating subsidiary, has purchased six Mack highway motor coaches.

Machinery and Tools

THE BOSTON & ALBANY is inquiring for a combination shear and punch.

THE NEW YORK CENTRAL has ordered four shapers from Joseph T. Ryerson & Son, Inc.

THE MICHIGAN CENTRAL has ordered a 90-in. locomotive journal lathe from Manning, Maxwell & Moore, Inc.

THE GREGG COMPANY, LTD., has ordered a 6-in. centering machine from the Niles-Bement-Pond Company.

THE PACIFIC FRUIT EXPRESS has ordered one Beaudry air hammer from Manning, Maxwell & Moore, Inc.

THE ST. LOUIS-SAN FRANCISCO has ordered a 90-in. locomotive journal lathe from Manning, Maxwell & Moore, Inc.

THE CHICAGO & NORTH WESTERN has ordered one 3-ton, 3-motor gantry crane and one 5-ton overhead crane from the Milwaukee Electric Crane & Manufacturing Company.

THE ATCHISON TOPEKA & SANTA FE is inquiring for one motor-driven punch and shear, one belt-driven engine lathe, two motor-driven milling machines and two motor-driven pipe machines. This company has ordered three drills, one side rod milling machine, one 42-in. boring mill and two portable lathes from Manning, Maxwell & Moore, Inc.

Signaling

THE CANADIAN PACIFIC has ordered from the Union Switch & Signal Company the necessary materials for the installation of automatic block signals on two sections of its Western lines, single track; from Kirkella, Man., to Whitewood, Sask., 46 miles, and from Glacier, B. C., to Albert Canyon, B. C., 20 miles. The work will require a total of 123 "T-2" signals and 433 relays. The signaling will be operated under the absolute permissive block system.

Supply Trade News

Thomas A. Rigby recently joined the force in the Pittsburgh office of the **McMyler-Interstate Company**, Cleveland, Ohio.

H. C. Osman, sales manager of the **Nugent Steel Castings Company**, Chicago, has also been elected secretary. C. A. MacDonald, formerly secretary, has been elected treasurer.

The **Chicago Fuse Manufacturing Company**, Chicago, manufacturers of electrical protecting materials and conduit fittings, has appointed L. F. Blendermann as district sales manager at Philadelphia, Pa.

L. J. Simmonds has been appointed district sales manager of the **Trumbull Steel Company**, Warren, Ohio, with headquarters at Chicago, to succeed A. R. Johnson, who has been transferred to New York.

S. R. Willock, formerly assistant sales manager of the Mackintosh-Hemphill Company, Pittsburgh, Pa., has been elected vice-president of the **Wellman-Seaver-Morgan Company**, Cleveland, Ohio, in charge of engineering and sales.

James C. Dannaher will in future look after the Pacific coast railway business of the **Murphy Varnish Company**, Newark, N. J. Mr. Dannaher will have his headquarters at the company's San Francisco, Cal., branch, 555 Mission street.

C. Marshall Taylor, superintendent of the Port Reading Creosoting plant of the Reading Company and the Central Railroad of New Jersey, at Port Reading, N. J., has resigned to become general manager of the **Sharples Solvents Corporation**, a company recently formed and now building a plant at Charleston, W. Va., to manufacture light alcohols for the lacquer industry.

T. W. Bennett, service engineer for the **Locomotive Stoker Company**, Pittsburgh, Pa., is now in Australia to supervise the initial operation of Duplex stokers on ten new Mountain type locomotives built according to American practice, by the Sir W. G. Armstrong Whitworth Company in England, which will soon go into service in South Australia.

Lee & Clark has recently been incorporated to take over the business conducted as a partnership under the name of the James T. Lee Company. James T. Lee is president and John O. Clark is vice-president, with offices at 549 W. Washington Boulevard, Chicago. The company specializes in hydraulic equipment, plate working tools, metal working machinery, pumps, car wheel borers, pipe benders, flexible steam joints, etc. Mr. Lee was formerly vice-president of the Hanna Engineering Works, Chicago, and for the past five years was western manager of the Southwark Foundry & Machine Company. Mr. Clark, for a number of years was sales manager of the Hanna Engineering Works, Chicago.

G. L. Moore, engineer maintenance of way of the Lehigh Valley, with headquarters at Bethlehem, Pa., has resigned to become president of the **Arcco Anti Rail Creeping Company**, with temporary headquarters at Owego, N. Y. He was born at Dunkirk, N. Y., on September 21, 1873, and entered railway service on March 5, 1890, as a rodman on the Erie at Hornell, N. Y. In 1898 he was promoted to assistant engineer, which position he held until 1900 when he was appointed supervisor. He held the latter position until 1901 when he was appointed roadmaster and on November 15, of the same year, was appointed division engineer of the Chicago & Alton. On July 1, 1902, he was appointed engineer of maintenance of way, which position he held until April 1, 1904, when he was appointed chief engineer of the Rutland. On February 15, 1909, he resigned to become engineer maintenance of way of the Lehigh Valley, which position he has held until his resignation.

American Steel Foundries

The earnings from operations of the American Steel Foundries after deducting manufacturing, filling and administrative expenses and federal taxes during 1925 were \$5,402,377. Dividends of \$3

per share were paid on the common stock during the year. The gross sales amounted to \$42,795,095, compared with \$46,088,069 in 1924. There was spent during the year \$773,119 in additions to property and \$2,586,942 for maintenance and repairs, the latter amount being charged to operating costs. The usual preferred stock sinking fund installment amounting with accretions to \$92,495 was set aside, and is carried in a separate bank account. The income account for 1925 with comparisons for 1924, follows:

	1925	1924
Earnings from operations, after deducting manufacturing, selling and administrative expense and federal taxes	\$5,402,377	\$5,759,070
Deduct—		
Depreciation	1,076,733	1,118,459
New profits from operations.....	\$4,325,644	\$4,640,611
Add—Miscellaneous income:		
Interest, discount and exchange, etc.....	\$177,109	\$134,041
Income from investments.....	347,732	303,002
	\$524,841	\$437,043
Total profits and income.....	\$4,850,485	\$5,077,654
Deduct—		
Net earnings of subsidiary company appertaining to the outstanding minority stockholdings.....	180,748	290,616
Net profits carried to surplus.....	\$4,669,736	\$4,787,038

Correction

The officers of the **Gibson Car & Manufacturing Company**, Harvey, Ill., formerly the Chicago Steel Car Company, are: **G. H. Gibson**, president, **A. H. Niblack**, vice-president, and **Thomas Baker**, secretary.

American Locomotive Company to Acquire Railway Steel Spring Company

One of the most important developments in the railway supply field in a long period of years is contained in the announcement made Thursday that the American Locomotive Company will take over the Railway Steel Spring Company. Stock of the locomotive company will be issued in exchange for stock of the spring company. **Frederick P. Fitzpatrick**, president of the Railway Steel Spring Company, is to become president of the locomotive company, and **William H. Woodin**, president of the American Car & Foundry Company and of the locomotive company, is to become chairman of the board of the enlarged locomotive company.

The official announcement gave details as follows:

"The boards of directors of the American Locomotive Company and the Railway Steel Spring Company, realizing that there are substantial economic advantages to be gained by a merger of the two companies, after a careful analysis of the two properties, have agreed upon what they believe to be the proper ratio of exchange, and are calling stockholders' meetings of their respective companies, recommending their approval of the merger.

"The Locomotive stockholders will be asked to increase both the preferred and common capital of their company so that they may, if the Railway Steel Spring shareholders accept the recommendation of their board, acquire the assets of the Railway Steel Spring Company by the delivery of securities that will permit each preferred stockholder of the Railway Steel Spring to receive one share of American Locomotive preferred for a share of Railway Steel Spring preferred, and each holder of a share of Railway Steel Spring common to receive two-thirds of a share of Locomotive common.

This merger and the basis agreed upon is approved by the largest shareholders of both companies.

Trade Publications

FIR GUTTERS.—The improved O. G. fir gutter for use on buildings subjected to fumes, smoke or acid vapors, such as railroad buildings, is described, and its application illustrated in a 16-page booklet issued by **E. M. Long & Sons**, Cadiz, Ohio.

AUTOMATIC ELECTRIC COALING STATION.—The **Roberts & Schaefer Company**, Chicago, has issued a 12-page booklet describing its "Simplex" patent automatic electric locomotive coaling plant. This booklet illustrates the operation of this station in detail by means of drawings and photographs supplemented by brief descriptive information. It is attractively gotten up and shows the essential features of this station clearly.

Railway Construction

ATCHISON, TOPEKA & SANTA FE.—This company has applied to the Interstate Commerce Commission for authority for the construction of a line of 30 miles from a connection with the Panhandle & Santa Fe, near Panhandle, Tex., to the oil fields in Hutchinson county, Tex.

ATCHISON, TOPEKA & SANTA FE.—This company will construct a freight station 24 ft. by 80 ft. at Huntington Park, Los Angeles. An additional shop, a freight yard and track facilities, including concrete drives and water mains, will be constructed at San Bernardino, Cal., at an estimated cost of \$500,000.

BALTIMORE & OHIO.—A contract has been awarded to the Vang Construction Company, Cumberland, Md., for the construction of concrete block retaining walls, replacing a trestle approach to the Allegheny river bridge at Millvale (Pittsburgh), Pa.; estimated cost, \$30,000.

BALTIMORE & OHIO.—A contract has been awarded to the Roberts & Schaefer Company for an automatic electric coaling hoist at Morgantown and Kingwood Junction, W. Va.

BOSTON & ALBANY.—A contract has been awarded to the C. A. Dodge Company, Cambridge, Mass., for the reconstruction of the fronts of a brick warehouse and freight house at Kneeland street, Boston, Mass., made necessary by street widening.

CENTRAL OF GEORGIA.—A contract has been awarded to Joseph E. Nelson & Sons, Chicago, for the construction of a two-story brick yard office at Albany, Ga., to cost approximately \$15,000.

CHICAGO & NORTH WESTERN.—This company has placed a contract with the Roberts & Schaefer Company for the rehabilitation of its coal-handling equipment at Adams, Wis.

CHICAGO & NORTH WESTERN.—Bids are being accepted until March 18, for the construction of a one-story brick freight station, 32 ft. by 256 ft., at Iron Mountain, Mich. A contract has been placed with the T. S. Leake Construction Company for the construction of a one-story frame and stucco passenger station, 17 ft. by 46 ft., at Bellwood, Ill.

CHICAGO, MILWAUKEE & ST. PAUL.—A contract has been awarded to the Woods Brothers Construction Company, Lincoln, Neb., for the placement of current retarders for bank protection in the Missouri river, just north of the railway bridge at Chamberlain, S. D., to cost \$50,000.

CHICAGO, ROCK ISLAND & PACIFIC.—This company will soon apply to the Interstate Commerce Commission for permission to construct a 33-mile line from Trenton, Mo., to Braymer, to connect with the Chicago, Milwaukee & St. Paul, whose line it will use into Kansas City. Plans have been prepared for the construction of coaling stations at Marengo, Ia., and Council Bluffs. A contract has been awarded to Fairbanks, Morse & Company, for the construction of a coaling station at Eldon, Ia.

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.—A contract has been awarded to H. A. Glaser, of Muncie, Ind., for the construction of an engine terminal at Kankakee, Ill., to cost \$264,000, as reported in the *Railway Age* of February 6.

DENVER & RIO GRANDE WESTERN.—Improvement program for this year calling for an expenditure of more than \$9,000,000, includes the following construction projects: Additional yard and passing tracks at Pueblo, Col., to cost \$125,000, and at Tennessee Pass, Midway, Monte Vista, Akin, Lacy, Chacra, Clifton, Tunnel, Gale, Woodside, Mesa, Walsenburg, Burnham and Minturn; grade revisions at Burnito, Buena Vista, Belden, Farnham, Wellington and Maxwell; an extension from Helper, Utah, to Kenilworth, a distance of six miles; stations at Walsenburg, Ogden and Castle Gate; an extension to the enginehouse at Minturn, and installation of turntables at Gunnison and Marshall Pass. Grade crossing elimination at Castle Rock, Portland, and at Iowa Street in Denver, will cost \$124,700.

ERIE.—This company is receiving bids for the elimination of a grade crossing at Piaget avenue, Clifton, N. J. The first section of the grade crossing elimination program at Paterson, N. J., is nearing completion and contracts will probably be awarded covering the second section during the current month.

GREAT NORTHERN.—This company will construct a gravel-wash-plant at Reiter, Wash., which will cost approximately \$150,000.

ILLINOIS CENTRAL.—A contract has been awarded to Joseph E. Nelson & Sons, Chicago, for the construction of a boiler shop, paint and tank shop at Paducah, Ky. A contract has been awarded to the Ellington Miller Company, Chicago, for the construction of an iron shed, brass foundry, storehouse, wash and locker buildings at Paducah.

LOUISVILLE & NASHVILLE.—Plans are being prepared for the construction of a shop building at West Paris, Tenn., to replace a structure recently destroyed by fire.

MERIDIAN & BIGBEE RIVER.—The Interstate Commerce Commission has made public a proposed report by Examiner W. U. Watson recommending a finding by the commission that public convenience and necessity have not been shown to require the construction of the proposed line from Meridian, Miss., to Myrtlewood, Ala., 50 miles, on the ground that the evidence does not warrant the conclusion that the traffic and revenues which the proposed railroad would be able to obtain would be sufficient to sustain the line if built.

MIDLAND VALLEY.—A contract has been awarded to the Roberts & Schaefer Company, Chicago, for the installation of an electric engine coaler for coaling locomotives direct from cars at Wichita, Kan.

NEW YORK CENTRAL.—The installation of a gantry crane at Rochester, N. Y., to cost approximately \$51,000, has been authorized. A contract has been awarded to L. M. Neckerman & Co., Inc., New York, for the installation of a new elevator in Hall B, Grand Central Terminal, with the removal and remodeling of the existing construction and finish; estimated cost, \$80,000.

NEW YORK, NEW HAVEN & HARTFORD.—This company has authorized a 7-stall extension to its enginehouse at Worcester, Mass.; to cost approximately \$135,000. A contract has been awarded to the Bethlehem Steel Company for the installation of a 100-ft. twin-span turntable at Cedar Hill (New Haven), Conn.; estimated cost, \$22,000.

NORTHERN OKLAHOMA.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of a line of 15 miles in Craig county, Oklahoma, beginning at a point near Venita.

OKLAHOMA & RICH MOUNTAIN.—The Interstate Commerce Commission has authorized this company to construct a line from a connection with the Kansas City Southern at Page, Okla., southwesterly to a connection with the St. Louis-San Francisco at Talihina, approximately 35 miles. The estimated construction cost is \$135,750.

PENNSYLVANIA.—A contract has been awarded to the W. F. Trimble & Sons Company, Pittsburgh, Pa., for the construction of a station at New Brighton, Pa., to cost approximately \$50,000.

PENNSYLVANIA.—A contract has been awarded to the Newhall Company, Cleveland, O., for track-laying on the new cut-off from Canton, O., to Bayard; estimated cost, \$700,000. Contracts have been awarded to A. Guthrie & Co., St. Paul, Minn., for second main track construction from Casey, Ill., to Shoyer, and from west of Greenup, Ill., to Montrose, each of which projects is estimated to cost \$90,000.

PEORIA & PEKIN UNION.—A contract has been awarded to the Roberts & Schaefer Company, Chicago, for the construction of a 500-ton three track locomotive coaling and sanding plant at Peoria, Ill., and for the construction of two electric cinder plants adjacent to the coaling station.

PERRY & SOUTHEASTERN.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of a line from Perry to Clinchfield, Ga., 7.6 miles.

READING.—A contract has been awarded to George F. Dobbin, Philadelphia, Pa., for the construction of a steel and concrete bridge at Rising Sun avenue and Venango street, Philadelphia, at an estimated cost of \$100,000—which expense will be shared by the municipality.

ST. LOUIS-SAN FRANCISCO.—A contract for bridge work at Kansas City, to cost approximately \$50,000, has been awarded to the Virginia Bridge & Iron Company, Roanoke, Va.

ST. LOUIS-SAN FRANCISCO.—The Interstate Commerce Commission has made public a report proposed by Examiner Schutrumpf recommending a finding by the commission that public convenience and necessity has not been shown to require the construction of a branch line in Garfield county, Okla., from a point near Covington northeasterly to a point in the Garber oil field, 5.42 miles.

SEABOARD AIR LINE.—This company has placed a contract with the Roberts & Schaefer Company, Chicago, for a 300-ton capacity automatic electric, reinforced concrete, three-track, locomotive coaling and sanding plant at Wildwood, Fla.

SOUTHERN.—A contract for bridge work on this road, Lines East, to cost approximately \$105,000, has been awarded to the Virginia Bridge & Iron Company, Roanoke, Va.

SOUTHERN PACIFIC.—This company will construct an ice storage warehouse at Tucson, Ariz.

SOUTHERN PACIFIC.—The construction of an enginehouse, with a shop for locomotive repair work is planned in connection with the establishment of a freight and classification yard at Miller's Switch, about six miles from Dallas, Tex. The project is estimated to cost \$850,000.

SPRINGFIELD, HAVANA & PEORIA.—The electrification of this line is now under consideration, according to J. F. Gilchrist, vice-president of the Commonwealth Edison Company, Chicago, which owns the railway. The Springfield, Havana & Peoria is a new company, operating a line from Springfield, Ill., to Peoria, which was recently purchased from the Chicago, Peoria & St. Louis.

WESTERN PACIFIC.—This company's 1926 improvement program includes \$200,000 for industrial tracks at San Francisco, Cal. The present yards at Oakland will also be extended by the addition of two 80-car tracks. A branch line to connect Lodi with Villinger will be constructed. A total of \$250,000 will be spent for replacing six large and seven small wooden bridges with steel bridges between Elko, Nev., and Wells. A wooden trestle will be replaced with a fill at Doyle, Cal., and a 110-ft. continuous turntable and new signals will be installed at Oroville.

Reading to Spend \$30,000,000

An improvement program involving the expenditure of \$30,000,000 during the next twelve months by the Reading Company has been announced. The program includes: Enlargement of facilities at the Reading terminal with the addition of new tracks and office buildings space; improvement of the company's property along the Delaware river; elimination of grade crossings at a cost of \$6,000,000; erection of a \$10,000,000 produce terminal and yard in conjunction with the Baltimore & Ohio; enlargement of the Delaware river ferry service; consideration of plans for electrification of suburban lines; expenditure of approximately \$4,000,000 for new repair shops at Reading, Pa.

FINES AND FARES aggregating approximately \$63 with the alternative of 98 days' imprisonment with hard labor, were imposed upon a passenger at Cape Town, South Africa, for riding without a season ticket. During a recent examination of tickets at Cape Town when requested to produce his ticket the passenger stated that he had inadvertently left his season ticket at home and gave what purported to be his name and address. The ticket examiner recognized the man as a passenger who had traveled without a ticket on a previous occasion, and who had given a fictitious name and address. The passenger, on being further interrogated, ultimately admitted that he had given a fictitious name. He was then handed over to the police who identified him as having been concerned in 10 previous cases of traveling without a ticket and giving fictitious names.

Railway Financial News

AKRON, CANTON & YOUNGSTOWN.—Bonds Authorized.—The Interstate Commerce Commission has authorized the issuance of \$800,000 general and refunding mortgage 5½ per cent bonds, series B, to be sold to Faxon, Gade & Co., Inc., Boston, Mass., at 89. The proceeds will be used to reimburse the company's treasury for additions and betterments already made and for expenditures to be made including, among other things, the acquisition of land at East Akron, Ohio, for industrial tracks.

AMADOR CENTRAL.—Final Value.—The Interstate Commerce Commission has placed the final value for rate-making purposes at \$361,456, as of 1916.

BIRMINGHAM TERMINAL COMPANY.—Tentative Valuation.—The Interstate Commerce Commission has served a tentative valuation report placing the final value for rate-making purposes of the property owned and used for common-carrier purposes at \$1,560,800 as of 1916.

CANADIAN PACIFIC.—Lease of Boston & Maine Subsidiary.—The Interstate Commerce Commission has approved the sub-leasing to the Canadian Pacific of the Boston & Maine's Wells River line from Wells River, Vt., to the international boundary at Derby, 69 miles. In connection with this proposed sub-leasing of its Wells River line, the Boston & Maine has also turned over the lease of the Massawippi Valley to the Quebec Central, a Canadian Pacific subsidiary, but this proposed transfer is not involved in this case. The Wells River line and the Massawippi Valley together form a route from Wells River, Vt., to Sherbrooke, Que. The Wells River line connects with Montpelier & Wells River at Wells River with the St. Johnsbury & Lake Champlain at St. Johnsbury, Vt., which two carriers are both subsidiaries of the Boston & Maine and the management of which has recently been turned over to local interests. The commission's decision gives the following data:

"For some years the B. & M. has planned to relieve itself from the duty of operating the Massawippi Valley, which is the only line operated by it in Canada. The testimony is that this railroad originates but little local business; that its traffic is almost wholly overhead; and that the operation desired to secure a connection with the B. & M. at some point south of Newport, in order to place it more on a parity with the Canadian National, which connects with the B. & M. at White River Junction. By so doing it is believed that it can increase its traffic from New England points, and to that end it has agreed to lease the two lines. The Canadian lines give the industries in New England, particularly in northern New England, two gateways through Canada, which, it is testified, have been of benefit in times of congestion, and of value at all times to many manufacturers because of their differential westbound rates. . . . If the proposed sub-lease becomes effective the St. Johnsbury & Lake Champlain and Montpelier & Wells River Railroads will connect directly with the C. P. This is expected to result in an expedited service, a better car supply, and perhaps some reduction in rates through the elimination of one intermediate carrier. . . . The C. P. service will terminate at Wells River, where connection will be made with the B. & M. instead of at Newport. . . . The project apparently has the united support of the commercial interests in the affected territory."

The sub-lease of the Wells River line to the Canadian Pacific is for a term of 30 years from March 1, 1926, at a rental of \$246,000, equivalent to 6 per cent of the line's value.

CENTRAL OF OREGON.—Final Value.—The Interstate Commerce Commission has found the final value for rate-making purposes to be \$106,882 as of 1916.

CHARLESTON TERMINAL.—Tentative Valuation.—The Interstate Commerce Commission has issued a tentative valuation report as of 1918, placing the final value for rate-making purposes of the common-carrier property owned and used at \$1,457,000.

CHATAHOOTCHEE VALLEY.—Final Value.—The Interstate Commerce Commission has found the final value for rate-making purposes to be \$585,137 as of 1917.

CHICAGO & ALTON.—Statement of Stockholders' Protective Committee.—Salmon O. Levinson, counsel for the Stockholders' Protective Committee of the Chicago & Alton has issued a statement relative to the contemplated reorganization as follows:

"The stockholders will agree to the final plan as a whole or not at all. The nature of the security it will ask in return for an assessment will depend in part on the amount of the assessment upon which can be figured the cost of retaining the stock. With a small assessment, say \$5 to \$8,

we could take stock; with an assessment of \$15 or so we could take income bonds; but with an assessment of \$30 we should have to ask for a prime security. The governing factor is the net market loss."

CHICAGO & EASTERN ILLINOIS.—Equipment Trust Certificates.—The Interstate Commerce Commission has approved the issuance of \$900,000 5 per cent equipment trust certificates, series A, to be sold to Kuhn, Loeb & Co., at 99.25. The certificates mature in equal installments on February 1 in each of the years 1927 to 1941. The equipment includes 500 70-ton all steel hopper cars having a total approximate cost of \$1,200,000.

CHICAGO, MILWAUKEE & ST. PAUL.—Receivership Proceedings.—A petition to intervene in the receivership proceedings and a supporting brief were filed by attorneys in behalf of five members of the bondholders' defense committee with the United States district court at Chicago on March 5. It was charged that the St. Paul was thrown into receivership by itself or its attorneys in order to create defaults under the junior mortgages, thus facilitating foreclosure of the mortgages and making possible the alterations of the financial structure of the road desired by the bankers. The petition stated that the petitioners are informed and believe that at some date prior to January 7, 1925, a decision was reached by Kuhn, Loeb & Co. and the National City Company, New York, bankers of the railway, to procure a reorganization of the financial structure of the company. On March 17 the president advised the board of directors that suit by the Binkley Coal Company for appointment of a receiver was expected to be brought. The board instructed its attorneys to admit the allegations and consent to a receivership. The petition further set forth that the Binkley suit was not a bona-fide attempt to secure payment of a claim, but was brought solely at the instigation and request of the railway or its attorneys.

Nathan L. Miller, former governor of New York, representing the junior bondholders, told the court that the Chicago, Milwaukee & St. Paul was not bankrupt when a receivership petition was filed in the court a year ago, and that the action was precipitated by Kuhn, Loeb & Co. and the National City Company with an ulterior and improper purpose of reorganizing the road's financial structure at the expense of the junior bondholders. He sought to be permitted to intervene in the bankruptcy proceedings in behalf of a group of bondholders having approximately \$16,000,000 of the railroad's bonds.

Federal Judge James H. Wilkerson set April 8 as the date for the trial of the suit of foreclosure against the Chicago, Milwaukee & St. Paul, filed by the Guaranty Trust Company of New York. On March 15, Judge Wilkerson will conduct a hearing relative to the payment of interest on the receivers' bonds known as the Terre Haute and Gary securities.

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.—1925 Earnings.—The preliminary income statement for 1925 shows net corporate income after charges of \$11,407,525, equivalent after allowance for preferred dividends to \$23.19 a share on the \$47,028,700 outstanding capital stock. Net corporate income in 1924 was \$8,080,932 or \$16.11 a share. The condensed income statement follows:

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS			
	1925	1924	Increase or decrease
Average mileage operated.....	2,391.46	2,398.01	6.55
Railway operating revenues.....	92,061,069	87,712,381	4,348,688
Total Operating Expenses.....	67,001,481	66,740,728	260,753
Operating ratio	72.78	76.09	—3.31
Net revenue from operations.....	25,059,588	20,971,654	4,087,934
Railway tax accruals.....	5,534,374	4,906,837	627,538
Railway operating income.....	19,488,481	16,049,966	3,438,515
Equipment rents, net dr.....	91,940	1,112,206	—1,020,266
Joint facility rents, net dr.....	835,832	573,492	262,339
Net railway operating income.....	18,560,709	14,364,267	4,196,442
Non-operating income	1,596,341	1,477,394	118,947
Gross income	20,156,869	15,845,727	4,311,142
Rent for leased roads.....	587,731	150,299	437,432
Interest on funded debt.....	7,450,885	7,073,343	377,542
Total deductions from gross income.....	8,749,344	7,764,795	984,549
Net income	11,407,525	8,080,932	3,326,593
Disposition of net income:			
Divs. on pref. stock 5 per cent.....	499,925	499,925	.....
Divs. on com. stock 5½ per cent in 1925, 5 per cent in 1924.....	2,586,578	2,351,435	235,143
Surplus for year carried to profit and loss.....	8,275,721	5,186,354	3,089,367

DELAWARE, LACKAWANNA & WESTERN.—Correction.—In the article in the *Railway Age* of February 27, entitled "Lackawanna Maintains Earnings" it was incorrectly stated that the consideration received by the Lackawanna for the coal lands turned over to the Glen Alden Coal Company was \$40,000,000. This amount should have read \$60,000,000.

ERIE.—Equipment Trust.—This company has applied to the Interstate Commerce Commission for authority to assume obligation and liability in respect of \$2,190,000 of 4½ per cent equipment trust certificates, to be sold at 97.

FLORIDA EAST COAST.—Equipment Trust.—This company has applied to the Interstate Commerce Commission for authority for an issue of \$2,700,000 of 4½ per cent equipment trust certificates, to be sold to J. P. Morgan & Co. at 97.

GRAYSONIA, ASHDOWN & NASHVILLE.—Securities.—This company has applied to the Interstate Commerce Commission for authority for an issue of \$300,000 of common stock and \$300,000 of first mortgage 6 per cent bonds, the proceeds to be used in part for acquiring certain railway properties of the Memphis, Dallas & Gulf, in Howard and Little River counties, Arkansas.

MICHIGAN CENTRAL.—1925 Earnings.—The preliminary income statement for 1925 shows net corporate income, after charges, of \$18,806,194, equivalent to \$100.36 a share on the \$18,736,400 outstanding capital stock. Net corporate income in 1924 was \$13,627,534, or \$72.73 a share. The condensed income statement follows:

MICHIGAN CENTRAL		1925	1924	Increase or decrease
Average mileage operated.....	1,871.32	1,862.25	9.07	
Railway operating revenues.....	91,864,377	87,614,662	4,249,715	
Total operating expenses.....	61,893,039	62,159,524	-266,485	
Operating ratio	67.37	70.95	-3.58	
Net revenue from operations.....	29,971,338	25,455,138	4,516,200	
Railway tax accruals.....	5,864,590	5,584,590	280,000	
Railway operating income.....	24,086,561	19,840,033	4,246,528	
Equipment rents, net cr.....	227,070	Dr. 312,265	539,335	
Joint facility rents, net dr.....	543,650	542,484	-1,166	
Net railway operating income.....	23,763,981	18,985,283	4,778,698	
Non-operating income	1,485,341	1,103,961	381,380	
Gross income	25,292,987	20,122,325	5,170,662	
Rent for leased roads.....	2,735,142	2,734,782	360	
Interest on funded debt.....	3,532,743	3,541,245	-8,502	
Total deductions from gross income..	6,486,793	6,494,791	-7,998	
Net income	18,806,194	13,627,534	5,178,661	
Dividends, 27½ per cent in 1925, 20 per cent in 1924.....	5,152,510	3,747,280	1,405,230	
Surplus for year carried to profit and loss	13,653,684	9,880,254	3,773,430	

MISSISSIPPI EASTERN.—Final Value.—The Interstate Commerce Commission has placed the final value for rate-making purposes at \$227,206 as of 1915.

MISSOURI, OKLAHOMA & GULF.—Tentative Valuation.—The Interstate Commerce Commission has served a tentative valuation report as of 1919, placing the final value for rate-making purposes of the property owned at \$5,827,377 and of the property used at \$7,757,877.

MONTREAL & ATLANTIC.—Final Value.—The Interstate Commerce Commission has placed the final value for rate-making purposes at \$872 for the property owned and used and \$1,009,000 for that used, as of 1916.

NEW YORK CENTRAL.—1925 Earnings.—The condensed statement of earnings shows for 1925 net corporate income, after charges, of \$48,627,240, as compared with \$39,250,400 in 1924, an increase of \$9,376,824. President P. E. Crowley points out that although the outstanding capital stock was increased during the year by \$78,000,000 largely through the conversion into stock of its 6 per cent debentures (of which \$11,611,300 were converted in 1924 and \$76,240,000 in 1925), the company earned almost as much per share in 1925 (\$12.69) as it did in 1924 (\$12.88). The condensed income account which follows includes figures for the Boston & Albany and the Ohio Central Lines:

NEW YORK CENTRAL		1925	1924	Increase or decrease
Average mileage operated.....	6,930.60	6,920.19	10.41	
Railway operating revenues.....	385,994,505	369,606,930	16,387,575	
Total operating expenses.....	290,440,958	279,970,163	10,470,795	
Operating ratio	75.24	75.75	-0.51	
Net revenue from operations.....	95,553,546	89,636,767	5,916,779	
Railway tax accruals.....	25,343,923	23,289,540	2,054,383	
Railway operating income.....	69,992,348	66,167,887	3,824,461	
Equipment rents, net dr.....	5,079,852	4,602,564	477,288	
Joint facility rents, net cr.....	3,008,054	3,069,751	-61,697	
Net railway operating income.....	67,920,550	64,635,074	3,285,476	
Non-operating income	25,419,095	24,123,217	1,295,878	
Gross income	93,430,020	88,921,304	4,508,716	
Rent for leased roads.....	14,079,485	13,027,600	1,051,885	
Interest on funded debt.....	28,684,284	34,191,311	5,507,027	
Total deductions from gross income..	44,802,796	49,670,904	-4,868,108	
Net income	48,627,224	39,250,400	9,376,824	
Dividends, 7 per cent.....	26,732,833	20,728,835	6,003,998	
Surplus for year carried to profit and loss	21,768,273	18,399,461	3,368,812	

NORFOLK & WESTERN.—State Opposes Lease of Virginian.—J. R. Saunders, attorney general of Virginia, in a brief filed with the Interstate Commerce Commission, opposes the pending application of the Norfolk & Western for authority to acquire control of the Virginian by lease, on the ground that they are parallel and competing lines; that the proposed acquisition would be beyond the charter powers of both companies and in violation of the constitution of Virginia, and that it would eliminate the prospects of competition in service at Norfolk.

OHIO & KENTUCKY.—Final Value.—The Interstate Commerce Commission has placed the final value for rate-making purposes at \$632,000 as of 1917.

ORANGE & FREDERICKSBURG.—Operation of Line.—The Interstate Commerce Commission has issued a certificate authorizing this company to take over and operate the narrow-gauge railroad formerly owned and operated by the Potomac, Fredericksburg & Piedmont from Fredericksburg, Va., to Orange, 37.6 miles. The new company was organized by local interests who desire to maintain the service rendered by the Potomac, Fredericksburg & Piedmont, which latter company was recently ordered dissolved by the State Corporation Commission of Virginia.

PENNSYLVANIA.—Annual Meeting.—The proxies recently mailed out to the company's stockholders for the annual meeting to be held in Philadelphia on April 13 are accompanied by a notice advising the stockholders that approval will be asked at the meeting for the lease of the property and franchises of the Pennsylvania, Ohio & Detroit. This is a subsidiary of the Pennsylvania, consisting of a consolidation of five lines, including the direct line from Columbus, Ohio, to Sandusky, and the recently projected and completed Detroit Extension, by which the Pennsylvania Railroad gained entrance to Detroit. Particular attention of the stockholders is called to the fact that a two-thirds vote of all stockholders is required by law in order to ratify this lease. The lease is an important step in carrying out the Pennsylvania policy of simplifying and compacting the corporate organization of the system, and the management states that it is, therefore, extremely desirous that the required two-thirds vote may be recorded. All of the capital stock of the Pennsylvania, Ohio & Detroit is already owned by the Pennsylvania.

New Directors.—Julien L. Eysmans, vice-president in charge of traffic, and Moorhead C. Kennedy, vice-president in charge of purchases, stores and insurance, have been elected members of the board of directors. They take the places of Henry Tatnall, former vice-president in charge of finance, who was relieved from active duty April 30, 1925, under the retirement regulations, and George D. Dixon, former vice-president in charge of traffic, who on August 1, 1925, was appointed assistant to the president. Under the charter of the Pennsylvania, 13 directors are elected by the stockholders to serve with them as members of the board. It has been the custom to carry out this provision by the selection of four vice-presidents of the company.

PERE MARQUETTE.—Dividend Increase.—Directors, on March 10, declared an additional dividend of ½ of one per cent on the com-

mon stock and an extra dividend of 2 per cent payable May 1 to stockholders of record on April 15. This has the effect of increasing the dividend rate from 4 per cent which has been paid since July 2, 1923 to 6 per cent and the 2 per cent extra serves to make the increased rate retroactive to 1925. E. N. Brown, chairman of the board, made the following statement:

"Directors consider the present action conservative, since we are only paying half of our earnings on the stock. The action is no more than fair, because stockholders received no dividends during the seven years following the termination of receivership. Pere Marquette is in good financial position and the present outlook is most favorable."

PITTSBURGH & LAKE ERIE.—1925 Earnings.—The preliminary income statement for 1925 shows net corporate income after charges of \$7,369,603, equivalent to \$10.23 a share on the \$35,985,600 outstanding \$50 par value capital stock. Net corporate income in 1924 was \$6,165,155 or \$8.56 a share. The condensed income statement follows:

PITTSBURGH & LAKE ERIE			
	1925	1924	Increase or decrease
Average mileage operated.....	231.46	231.46	.....
Railway operating revenues.....	32,026,689	31,421,149	605,540
Total operating expenses.....	25,455,383	25,590,148	—134,765
Operating ratio	79.48	81.44	—1.96
Net revenue from operations.....	6,571,306	5,831,001	740,305
Railway tax accruals.....	2,178,545	1,908,506	270,039
Railway operating income.....	4,389,744	3,919,542	470,201
Equipment rents, net cr.....	4,588,330	4,292,149	296,181
Joint facility rents, net cr.....	86,284	65,471	20,813
Net railway operating income.....	8,891,790	8,146,221	745,569
Non-operating income	1,206,108	1,079,676	126,432
Gross income	10,097,898	9,225,897	872,001
Rent for leased roads.....	794,816	819,708	—24,892
Interest on funded debt.....	509,787	543,876	—34,089
Total deductions from gross income.....	2,728,296	3,060,742	—332,446
Net income	7,369,603	6,165,155	1,204,448
Disposition of net income:			
Dividends, 10 per cent.....	3,598,560	3,598,560	.....
Surplus for year carried to profit and loss	3,771,043	2,566,595	1,204,448

RAQUETTE LAKE.—Final Value.—The Interstate Commerce Commission has found the final value for rate-making purposes to be \$355,427 as of 1917.

ROME & NORTHERN.—Final Value.—The Interstate Commerce Commission has found the final value for rate-making purposes to be \$265,925 as of 1915.

RUTLAND.—1925 Earnings.—The preliminary income statement for 1925 shows net corporate income after charges of \$371,913, equivalent to \$4.15 a share on the \$8,955,400 outstanding preferred stock. Net corporate income in 1924 was \$407,309 or \$4.54 a share on the preferred. The condensed income statement is as follows:

RUTLAND R. R.			
	1925	1924	Increase or decrease
Average mileage operated.....	413.01	413.01	.....
Railway operating revenues.....	\$6,440,041	\$6,509,062	—\$69,021
Total operating expenses.....	5,449,501	5,476,007	—26,506
Operating ratio	84.62	84.13	0.49
Net Revenue from Operations.....	990,541	1,033,055	42,514
Railway tax accruals.....	310,321	297,307	13,014
Railway operating income.....	679,905	735,324	55,419
Equipment rents, net cr.....	51,963	12,466	39,497
Joint facility rents, net cr.....	54,795	51,818	2,977
Net Railway Operating Income.....	786,663	799,608	—12,944
Non-operating income	73,645	79,087	—5,442
Gross income	860,308	878,695	—18,386
Rent for leased roads.....	19,000	19,000	.....
Interest on funded debt.....	463,739	447,175	16,564
Total deductions from gross income.....	488,396	471,385	17,011
Net income	371,913	407,309	—35,396

SEABOARD AIR LINE.—Subscription Limit Extended.—The time within which subscriptions may be made for the stock of the Investment and Securities Company of Florida (see *Railway Age* of February 27) has been extended from March 11, 1926, to April 9.

SPRINGFIELD, HAVANA & PEORIA.—Securities.—The Interstate Commerce Commission has approved the lease of this property by the Chicago & Illinois Midland. This approval follows a revision of the terms of the lease, in accordance with the rules set forth in the Interstate Commission's recent decision as reported in the *Railway Age* of February 27, authorizing the Springfield, Havana & Peoria to take over that portion of the former Chicago, Peoria & St. Louis from Springfield to Pekin and approving the necessary financing in connection therewith.

TENNESSEE CENTRAL.—Securities.—The Interstate Commerce Commission has authorized this company to issue 60,000 shares of common stock without par value in exchange for \$3,000,000 of outstanding common stock of a par value of \$100 a share; \$500,000 of 7 per cent cumulative preferred stock to be sold at not less than 95; 10,000 shares of no-par common stock to be held and used for the conversion of \$500,000 of preferred stock; and \$1,500,000 of first mortgage 6 per cent bonds, to be sold at not less than 95.

TRINITY & BRAZOS VALLEY.—Receivers' Certificates.—The receiver has applied to the Interstate Commerce Commission for authority to issue \$90,000 of receivers' certificates and to extend \$210,000 of certificates until January 1, 1927.

WELLINGTON & POWELLSVILLE.—Foreclosure Sale.—The sale to William C. Everett, of Portsmouth, Va., has been confirmed by Judge I. M. Meekins in the United States District Court.

Final Valuations

The Interstate Commerce Commission has issued final valuation reports by Division I, in a number of valuation cases covering small railroads, finding the final value for rate-making purposes of the property owned and used for common-carrier purposes, as of the respective valuation dates, to be as follows:

Arizona Southern	\$332,288	1915
Bingham & Garfield.....	5,827,183	1916
Cache Valley	60,256	1917
Cimarron & Northwestern.....	226,810	1916
Groveton, Lufkin & Northern.....	291,840	1919
Iowa Transfer	63,000	1917
Mascot & Western.....	133,717	1917
Mississippi River & Bonne Terre.....	3,551,550	1914
Moscow, Camden & San Augustine.....	76,456	1918
Mount Hood	507,032	1916
Nevada Transportation Co.....	35,762	1917
New Mexico Central.....	1,365,024	1916
Northwestern Coal Co.....	77,500	1915
Oneida & Western.....	625,000	1918
Oregon, Pacific & Eastern.....	321,117	1917
Quachita & Northwestern.....	354,944	1916
Pecos Valley Southern.....	373,409	1917
Philadelphia & Beach Haven.....	250,000	1916
Pickens	126,426	1916
Pine Bluff & Northern.....	32,516	1916

Dividends Declared

Alabama & Vicksburg.—3 per cent, semi-annually, payable April 1 to holders of record March 10.

Bangor & Aroostook.—Common, \$0.75, quarterly; preferred, 1¼ per cent, quarterly; both payable April 1 to holders of record March 13.

Boston & Providence.—2½ per cent, quarterly, payable April 1 to holders of record March 20.

New York, Lackawanna & Western.—1¼ per cent, quarterly, payable April 7 to holders of record March 13.

Pere Marquette.—Common, 1 per cent, quarterly, payable April 1 to holders of record March 15. Prior preferred, 1¼ per cent, quarterly; 5 per cent preferred, 1¼ per cent, quarterly; both payable May 1 to holders of record April 15.

Pittsburgh, Bessemer & Lake Erie.—Common, 1½ per cent, semi-annually, payable April 1 to holders of record March 15.

St. Joseph, South Bend & Southern.—Common, ¾ per cent; preferred, 2½ per cent, quarterly; both payable March 15 to holders of record March 11.

St. Louis, Rocky Mountain & Pacific.—Preferred, 1¼ per cent, quarterly; common, ½ per cent, quarterly; both payable March 31 to holders of record March 15.

St. Louis-Southwestern.—Preferred, 1¼ per cent, quarterly; payable March 31 to holders of record March 15.

Vicksburg, Shreveport & Pacific.—Common, 2½ per cent; preferred, 2½ per cent, semi-annually; both payable April 1 to holders of record March 10.

Average Price of Stocks and Bonds

	Last Mar. 9	Last Week	Last Year
Average price of 20 representative rail- way stocks	91.21	89.33	81.90
Average price of 20 representative rail- way bonds	95.15	94.70	90.47

Railway Officers

Executive

W. J. Stoneburner, formerly superintendent of the Quincy, Omaha & Kansas City, has been appointed vice-president and general manager of the New Orleans & Lower Coast, with headquarters at New Orleans, La.

George H. Crosby, assistant to the vice-president of the Chicago, Burlington & Quincy, with headquarters at Chicago, has retired effective March 15. He was born on September 23, 1855, at Hillsboro, Ill., and entered railway service on July 1, 1872, on the Hannibal & St. Joseph, at Hannibal, Mo., in whose employ he remained in various capacities until July 1, 1876. From the latter date until November, 1877, he was a claim clerk in the general freight office of the Chicago, Burlington & Quincy, and from February 1, 1878, to February 1, 1879, he held the same position on the International & Great Northern at Palestine, Tex. On February 1, he returned to the Chicago, Burlington & Quincy as a claim clerk, which position he held until June 1, 1878, when he became chief clerk in the general freight office on the Hannibal & St. Joseph, at Hannibal. From June 1, 1880, until August, 1881, he held the same position on the Chicago, Burlington & Quincy at Chicago, and from August 1, 1881, to July, 1883, he was general freight agent on the Kansas City, St. Joseph & Council Bluffs at St. Joseph, Mo. He resigned on July 1, 1883, to become first assistant general freight agent on the Burlington & Missouri River at Denver, Colo., which position he held until January, 1890, when he was promoted to general freight agent. He held the latter position until December 1, 1902, when he was appointed assistant freight traffic manager on the Chicago, Burlington & Quincy, which position he held until February 1, 1905, when he was promoted to freight traffic manager. From August, 1918, to March 1, 1920, he held the position of freight traffic manager of the Chicago, Burlington & Quincy and the Quincy, Omaha & Kansas City. At the end of federal control he was appointed assistant to the vice-president in charge of traffic, which position he has held until his recent retirement.

Operating

C. Hungerford has been appointed trainmaster of the Southern, between Macon, Ga., and Brunswick, with headquarters at Macon, Ga. The office of assistant trainmaster has been abolished.

J. B. Silaz, assistant superintendent of the St. Louis-San Francisco, with headquarters at Jonesboro, Ark., has been appointed general superintendent of the Missouri & North Arkansas, with headquarters at Harrison, Ark.

W. L. Richards, fuel supervisor of the Union Pacific, with headquarters at Omaha, Neb., has been appointed assistant to the general manager in charge of safety, with the same headquarters, to succeed Harry A. Adams, deceased.

Traffic

F. F. Robinson has been appointed general agent of the Union Pacific, with headquarters at Tulsa, Okla., in charge of a newly established agency.

R. F. Smith has been appointed general freight agent of the Wheeling & Lake Erie and the Lorain & West Virginia, succeeding **C. E. Dempsey**, resigned.

H. V. Bowman has been appointed general industrial agent of the Chicago & Eastern Illinois, with headquarters at Danville, Ill., a newly created position.

A. C. Hedlund has been appointed general agent, passenger department, of the Southern Pacific, with headquarters at Chicago, succeeding **C. T. Collett**, promoted.

M. M. Goodsill, assistant general passenger agent of the Northern Pacific, with headquarters at St. Paul, Minn., has been promoted to general passenger agent, with the same headquarters.

Arthur Mackenzie, assistant freight traffic manager of the Chicago, Rock Island & Pacific, with headquarters at Chicago, has been promoted to freight traffic manager, with the same headquarters, succeeding **Stanley H. Johnson**, vice-president and freight traffic manager, who died on February 15.

L. S. Goforth, assistant general freight agent of the Missouri Pacific, with headquarters at San Antonio, Tex., has been promoted to general freight agent, with the same headquarters, a newly created position. **R. H. Schultz**, traffic manager of the San Antonio, Uvalde & Gulf, has been appointed assistant general freight agent, with headquarters at Houston, Tex.

W. A. Beckler, passenger traffic manager of the Southern, with headquarters at Cincinnati, Ohio, after thirty-two years of continuous service, has at his own request, on account of his health, been relieved of active duty. Hereafter he will perform such special duties as are assigned to him by the passenger traffic manager at Washington, D. C. **E. N. Aiken**, general passenger agent, with headquarters at Cincinnati, Ohio, has been placed in charge of the work and territory heretofore coming under Mr. Beckler's jurisdiction, and will report to the passenger traffic manager at Washington, D. C.

Purchases and Stores

A. C. Simmons has been appointed acting purchasing agent of the Chicago Great Western, with headquarters at Chicago, succeeding **Benoit Briard**, who died on February 15.

C. L. Nash has been appointed general storekeeper of the Fruit Growers' Express and the Western Fruit Express, with headquarters at Alexandria, Va., succeeding **E. E. Anthony**, resigned.

Special

Harold Colee has been appointed manager of the public relations bureau of the Florida East Coast, with headquarters at St. Augustine, Fla.

Obituary

A. V. Redmond, district engineer on the Canadian National, with headquarters at Winnipeg, Man., died at Rochester, Minn., on March 1.

John T. Ewing, engineer of tests of the Chesapeake & Ohio, died on March 4, of heart disease in the Stuart Circle Hospital, Richmond, Va.

A. J. Alexander, formerly trainmaster on the Southern Kansas division of the Missouri Pacific, with headquarters at Coffeyville, Kan., died at Pueblo, Col., on March 1.

Miles Cary Selden, superintendent of the Richmond division of the Chesapeake & Ohio, whose death, following a brief illness, was reported in the *Railway Age* of March 6, was born at Snowden, Goochland county, Va., on September 15, 1874. At the age of twenty-one he was graduated from Virginia Military Institute. He entered the service of the Chesapeake & Ohio as assistant foreman at Newport News in April, 1902; was promoted to levelman, in the construction department, January, 1905; to resident engineer, Peninsular district, March, 1906; to division engineer, maintenance-of-way, Newport News and Norfolk terminal division, June 1, 1910; to supervisor of track, Rivanna district, May, 1912; to division engineer, Richmond division, September, 1914; to trainmaster, Rivanna district, November, 1916; to assistant superintendent, Newport News and Norfolk Terminal division, November, 1917; to acting superintendent, Clifton Forge division, October, 1919; to superintendent, Newport News and Norfolk Terminal division, November 15, 1919; to superintendent, Richmond division, February 1, 1923, in which latter position he was serving at the time of his death.